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Department of Museology

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EDITOR'S NOTE

The present volume by the Department of Museology is the fourth in order which is the outcome of joint efforts of the Faculty members. This volume is enriched with articles on various aspects on museology by teachers of the Faculty as well as by some former students and research scholars.

The Department of Museology established in 1959 is the second of its kind in this country after the M.S. University, Vadodara, where the course was introduced in 1954. The first volume was brought out during the tenure my Head ship of the Department in 2001. The first volume received wide appreciation from museologists and museum lovers. I have no hesitation to say that the present volume will be equally appreciated by scholars, researchers and students in the discipline of museology.

We are happy to record here that the authorities of the Calcutta University have extended all help and co-operation in bringing out the volume in time.

Dr. Chhanda Das
Head of the Department,
Museology

ENDANGERED WILD BACTRIAN CAMEL : NEW HORIZON OF RESEARCH AND INVESTIGATION

Dr. Chhanda Das

Camels, the beast of burden are found in two varieties in the world. The Arabian camel (c. dromedanus) has got only one hump but the Bactrian camel (c. bactrianus) has two humps The most striking difference between the two camel species are the number of humps forming localized fat deposits that provide a source of energy. In the Bactrian variety there are two humps while in case of Arabian camel there is only one hump. So far the body form is concerned, the Bactrian variety has generally a more massive body. The severity of extreme winter temperature has an effect on other aspects of body conformation of the Bactrian variety.

The history of domestication of camel is shrouded in mystery. It is presumed that the domestication might have began with the advent of neolithic times. The evidence of domestication of Arabian camel possibly took place in the borders of Arabia by 1800 B C., a fact confirmed by the discovery of Middle Bronze Age remains of camels at ancient urban sites in Israel. Subsequently Arabian camels were introduced in North Africa, the Nile Valley and the Middle East as far as northwestern India. Less is known of the history of the Bactrian camel. Evidences available from Shah Tepe in Iran and at Anau in Turkestan dating back the third millennium. B.C. have been tentatively assigned to this species. This particular variety had a wide distribution as a wild animal in Central and Northwestern Asia in prehistoric times. It is presumed that by the 5th century B.C., Bactrian camels were domesticated in Persia.

Present survey on camels reveals that the Bactrian variety occurs throughout the highlands of Central Asia, from Turkistan to Mongolia. The Arabian camel is spread throughout the Arab world and found widely in North Africa. Middle East. Afghanistan, Pakistan and India.

During the winter time, camels particularly the Bactrian variety grow thick shaggy coats, which they shed in Spring so that they look almost naked untill new coat starts growing.

A recent survey by the experts on Bactrian camel has put forward before us that as estimated 900 wild Bactrian camels survive in the world today. The wild variety of Bactrian camel found primarily in China and Mongolia have become critically endangered due to growing threats from wolf-predation, hunting, illegal mining and cross-breeding with domestic camels. The World Camel Protection Foundation (WCPF), a U.K. registered charitable foundation was founded in 1997 with an aim to protect this endangered vanishing variety. The above Foundation in convinience with the Governments of China and Mongolia has initiated in establishing nature reserves and captive-breeding programmes towards the survival of the species.

As early as 1877, Przewalsky, a distinguished Russian explorer drew the attention of scholars towards the existence of wild Bactrian camel to the outside world. He collected a few skins and a skull to St. Petersburg and thus raised an interest in animal lovers.

Head of the Department of Museology. Calcutta University. Kolkata.

Recent reports on wild Bactrian variety inform us that there are approximately 18 Bactrian camels in captivity, with 13 of these in Mongolia and roughly 5 in China. There are no wild Bactrian camels in captivity in any other country in the world. The researches on camel have revealed the concern of this endangered variety in both Chinese and Mongolian protected areas in near future.

The Wild Camel Protection Foundation (WCPF), a U.K. registered charitable foundation founded in 1997 has taken up the matter seriously. The Foundation has taken up the matter seriously. The Foundation has pursued the issue both with the Chinese and the Mongolian governments. In 1999 a proposal was put forward to the Chinese government to establish the Lop Nur Wild Camel Nature Reserve. The proposal ultimately won government support and WCPF received funds from the Global Environment Faculty in Washington, U.S.A. The State Environment Protection Administration (SEPA) of China and the Xinjiang Environment Protection Institute offered help and assistances for the establishment of a Reserve Fund.

In 2001 the Reserve was established and in 2003, it was upgraded to National Nature Reserve by the Chinese Central Government. It is learnt that the Mongolian Government has signed an agreement with the WCPF to initiate a captive wild Bactrian camel breeding programme near the Great Gobi Protected Area in Western Mongolia.

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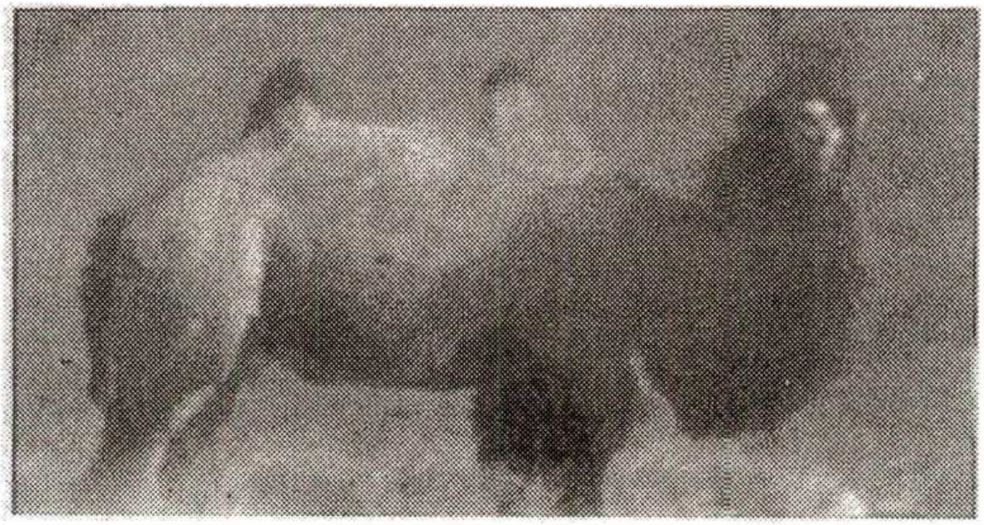

. CONSERVATION OF NATURAL HERITAGE— A MICRO STUDY

Sachindranath Bhattacharya *

The knowledge we possess of life before beginning of human memory and tradition is derived mostly from the markings and fossils of living beings in the stratified rocks. We have unearthed shale and slate, limestone, sandstone, bones, shells, fibers, stems, fruits, flowers, pollen grains, foot marks etc., which may be said the evidences of biodiversity of the past. It is by the critical analysis and examination of this record of the rock findings the past history of the earth life has been pieced together. We believe that the sedimentary rocks do not lie neatly stratum of stratum; they have been crumpled, thrust about, bent, distorted and mixed together like the leaves of manuscript that has been looted and burned repeatedly and it is only as a result of many devoted lifetimes of work that the records has been put into order and read. There is no trace of life process in the earliest rock-Azoic rocks (4200- 4600) millions years. I like to state here that half of the great interval of the time since land and sea were first distinguishable on the earth, has left no traces of life process. During archaeozoic period (1600-3800) evolution of monera took place and oxygen began to accumulate in atmosphere but there was no evidence of life process.

ORIGIN OF LIFE PROCESS

Origin of the life process took place in the Protozoic period. We know that three conditions are necessary for the origin of life from prebiotic organic molecules e.g.

i) Presence of replicators and self producing molecules. ii) Mutations in self producing molecules¼ iii) Perpetual supply of free energy and partial separation of replicators from general environment.

Since then there were Palaeozoic, Mesozoic, and Coenozoic era, but on and from protozoic era, distribution of life process had started. Indian subcontinent witnessed human activity during early, middle and late Stone Age (4,000,000-2, 00,000 B.C). Evolution of human society occurred about 12,000-10,000 years ago when humans learnt to domesticate some wild animals and plants e.g. dog, cattle, sheep, goat, pig, barley, wheat, lentil, pea, rice etc. All these cultured plants were originated on the coast of Bay of Bengal, Orissa, Andhra Pradesh. Rice cultivation started in India around 6000 years back at Mehergarh and Mahagarh. Ancient Indians developed varieties of rice with nutritious, fragrant, salt and flood resistant strains. Vedic literature (2500-600 B.C) categorically mentioned about 740 plants and 250 animals Chandyogya Upanishad has animals into three categories i) Jivaja (Viviparous) e.g. mammals ii). Andaja (Oviparous) e.g. worms, insects, reptiles, birds. iii) Udbhija (Vegetal Origin) e.g. minute animals.

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* Reader and former Head of the Department of Muscology, University of Calcutta.

In post vedic phase Susrata (600 B.C) in Susrata Samhita has classified living organism into i) Sthavara (immobile e.g. plants) and ii) Jangama (mobile e.g. animals). Again Susrata classified plants into i) Vanaspati—fruit yielding non flowering plants ii) Vriksha—fruit yielding flowering plants iii) Virudha—shrubs and creepers and iv) Osadhi—plants which die with ripening of fruits.

Besides the above different parts of plants had also differentiated and had also been given names e.g. Patra (leaf), Pushpa (flower), Phala (fruit), Kanda (bulb or stem), Mula (root), Ankura (sprout).

Similarly animals were classified into i) Kulacara—herbivorous frequenting river banks e.g. buffalo, elephant, ii) Matsya—(fish) iii) Jangala—wild herbivorous, quadrupeds, e.g. deer. iv) Guhasaya—carnivorous quadrupeds e.g. tiger, lion, snakes, leeches etc.

In India the study, interpretation and analysis of flora and fauna was an integral part of human life since prehistoric period, which is now known as biodiversity. Biological diversity or Biodiversity is the variety of organism from genetic variants and totality of genes of same species and variety of ecosystem of a specific region including their interaction and processes. It differs from place to place as each habitat has its distinct biota. Due to constant and continuous interference, destruction of habitat, explosion of human population, industrialization, globalization and such other many factors like social, political, educational, natural, cultural, economical, commercial, many biological rich and virgin habitat are being fragmented, degraded, deteriorated and finally destroyed.

Destruction of habitat has occurred many areas throughout the world. Degradation and/ or deterioration of habitat are the reduction in the quality of habitat that results in decline, extinction or loss of species. There may be addition or alteration due to the changes in environmental conditions, over exploitation of the habitat, air, water, soil pollution, introduction of an exotic species or selective annihilation of a species. It is to be kept in mind that annihilation of one species can bring harmful changes in the biota because of the interrelation and interdependence amongst the various components of biota. Habitat fragmentation is the breaking and/or separating of a large habitat into smaller sectors due to development of agriculture, water body and such many other changes. There is not only loss of species in the interrupted regions but also in the fragmented part of the habitat. It is due to the deterioration of habitat quality as the interior undisturbed part of the habitat diminishes or disappears during fragmentation. The phenomenon of reduction of species diversity in small sector patches is termed as *insularisation*. As a consequence there may be increase in number of species in the particular sector but ultimately it reduces. This phenomenon is called ***relaxation***.

The major factors that tend to decrease, endanger extinct biodiversity, as already stated, are increasing human population, changing way of life style, higher resource consumption, natural disaster, pollution etc. Loss of biodiversity reduces gene pool of a species, number of interactions in the biota and ability of species to adopt themselves in changing environment. It affects evolutionary advancement and put the surviving species to danger of extinction.

It is revealed from the available information that due to the destruction of habitat natural grasslands of USA has been considerably lost to human settlement and agriculture. In New Zealand 90% wetlands have been destroyed by European settlers. Satellite imaging has shown that forest have been lost at the rate of 170,000 km^2 / year between 1981-90. Due to habitat, degradation the endemic species, Silver wood of Hawaii, is going to become extinct due to the extinction of its sole insect pollinator.

Biodiversity and Its Dimensions :

The number of higher plants in the global village is 2, 70,000, vertebrates 53239, insects 10, 25,000, fungi 72,000, molluscs 70,000, algae 40,000, crustaceans 43,000, protozoan 40,000, nematodes and worms 25,000, bacteria 4000, virus 1550 along with the other groups accounting for 110,000 species. The numerical strength of species is 17,53739 (1.75) million. The number of identified species in India out of 1.75 million is 1,34,781 i.e. 7.7% (approximately) of the total. It is believed that the predicted numerical strength of species in the world is any where between 5-50 million. Most of the taxonomist of the world came to a conclusion that the number of species would be around 14 million. The major unknown areas which could not be studied thoroughly are tropics and coral reefs. Besides the above specific knowledge about protists, archaea, bacteria and viruses is quite inadequate and fragmentary. New species are being discovered faster than 15,000 / year due to the on going project work like Global Biodiversity Information Facility and Species 2000.

A comparative study on the number of identified species in the world to that of the number of identified species in India can be made to highlight the actual status of biodiversity in India.

Number of identified species in the world		Number of identified species in the India	
1. Higher plants	270000	1. Angiosperms	17500
2. Algae	40000	2. Gymnosperms	64
3. Fungi	72000	3. Pteridophyta	1100
4. Bacteria / cyano obacteria	4000	4. Bryophyta	2850
5. Viruses	1550	5. Lichens	2000
6. Mammals	4650	6. Fungi	14500
7. Birds	9700	7. Algae	6500
8. Reptiles	7150	8. Bacteria	850
9. Fish	26959	9. Mammals	300
10. Amphibians	4780	10. Birds	1232
11. Insects	1025000	11. Reptiles	456
12. Crustaceans	43000	12. Amphibians	209
13. Molluscs	70000	13. Fish	2546
14. Nematodes & Worms	25000	14. Protochordates	119
15. Protozoa	40000	15. Arthropods	68389
16. Others	110000	16. Molluscs	5000
		17. Protozoa	2577
		18. Other invertebrates	832

There are interrelated hierarchical levels in Biodiversity

- Genetic Diversity
- Species Diversity
- Community / Ecosystem Diversity

• Genetic Diversity :

It is the diversity in the number and types of genes and also the number of chromosomes present in different species and also the variation in the genes and their alleles in the same species. To explain the above thing we can state here that a *Bacteriophase* has 100 genes, *mycoplasma* 450-700 genes, *Escherichia coli* 4000 genes, *Saccharomyces cerevisiae* 6000 genes, *Drosophila melanogaster* 13000 genes, *Coenorhabditis elegans* 18000 genes, *Oriza sativum* 32000-50000 genes and *Homo sapiens sapiens* 30000-40000 genes. Variation in genes of a particular species increases with the increase in size and environmental parameters of habitat Formation of ecotypes depends upon it. Genetic diversity is useful in adaptation to change environmental conditions. It helps in speciation or evolution of a new species.

• Species Diversity :

It is the variety in number and richness of the species of a region. The number of species per unit area is called species richness. Number of individual of different species represent: species evenness or species equitability. Communities where species are represented by more less equal number of individual exhibit evenness. Similarly where one or more species have more individuals than other they show dominance or unevenness. So species diversity is a product both species richness or evenness or equitability.

• Community / Ecosystem Diversity :

It is of three types i.e. Alpha Diversity, Beta Diversity and Gamma Diversity.

Alpha Diversity is species diversity in a given habitat. It depends on species richness and evenness/equitability. There is a lot of competition, interrelationships and adjustments amongst the member of the same community but variations are very much limited.

Beta Diversity is a biodiversity which appears in a range of communities because replacement of species with the change of the community / habitat due to the presence different microhabitat, niches and variations in environmental conditions.

Gamma Diversity is present in ranges of communities as represented by diversity habitats /ecosystems over a total landscape or geographical area. Ecosystem Diversity represents variety of forms in the ecosystem due to the diversity of niches, tropic levels; ecological processes like nutrients recycling, energy flow, food webs, role of dominant species and various biotic interactions.

Biodiversity : A Critical Review

India is one of the twelve mega diversity regions of the world having 7.7% of genetic resources of the world. The country has been divided into 10 biographical regions.

(1) Trans Himalayas, (2) Himalayas, (3) Desert, (4) Semi-arid, (5) Western Ghats, (6) Deccan Peninsula, (7) Gangetic Plain, (8) North East, (9) Coasts, (10) Islands. Out of the above the largest biographical region is Deccan Peninsula which occupies 42% land mass

of the country. Similarly Western ghats (area 4.0%) and North-east (area 5.2 %) are considered as most biodiversity rich regions. Trans Himalayas is cold desert having sparse vegetation. There is a rich community of the Goat, Wild sheep and Snow Leopard. In Western Ghats and North-east, there are wild relatives of number of cultivated plants like Banana, Citrus Mango and Pepper etc. There are very good evergreen forest in the Andaman Nicobar and Lakhadweep islands. Mangrove vegetation is found in swamps along the coasts e g Sundarbans, Ratnagiri and Pichavaram which is unique feature of biographic profile of India.

Besides the above 10% mammals, 36% reptiles, 60% amphibians and 53% fresh water fish, 33% of flowering plants are restricted to a particular area or region i.e. endemic. In North East, North West, Western Ghats, Andaman Nicobar Islands,most of the endemics are available. In Western Ghats large number of endemic amphibians species has been identified. Although it is not yet possible to unveil the biological diversity of many wetlands, deep oceans, tree canopy and soil of tropical forest, socio cultural and natural heritage sites in relation to its eco-systems.

Important Protected Wildlife in India.

1. Lion (Started 1972) (*Panthera leo persica*)	Gir National Park, Junagarh (Gujrat)
2. Tiger (Started 1973) (*Panthera tigris*) in 27 National Parks/Sanctuaries.	i. Corbett National Park, Nainital, U.P.
	ii. Hazaribagh. Sanctuary, Hazaribagh, Bihar
	iii. Sunderbans Tiger Reserve 24 Parganas (W.B.)
	iv. Nandanthurai Sanctuary, Tiruenavelli, T.N
	v. Tandoba National Park, Chandrapura, Maharashtra.
	vi. Ranathambore National Park, Savai Madhpur, (Raj)
	vii. Kanha National Park, M.P.
	viii. Bandipur National Park, Mysore, Karnataka.
3. Snow leopard (*Panthera uncia*)	Khanngchendzona National Park (Gangtok)
4. Elephant (Started 1992) (*Elephas maximus*)	i. Manas Sanctuary, Barpeta (Assam)
	ii. Kaziranga National Park, Jorhat (Assam)
	iii. Corbett National Park, Nainital, U.P.
	iv. Palamau Sanctuary, Daltonganj (Bihar)
	v. Simlipal Sanctuary, Mayurvanj (Orissa)
	vi. Periyar Sanctuary, Idukki (Kerala)
5. Rhino (Started 1987) (*Rhinoceros unicornis*)	i. Kaziranga National Park, Jorhat (Assam)
	ii. Manas Sanctuary, Barpeta (Assam)
	iii. Jaldapara Sanctuary, Modhirat (Bengal)

6. Musk Deer (*Moschus mosciferus*)	Shikari Devi Sanctuary, Mandi (M.P.)
7. Black Buck (*Antelope cervicarpa*)	i. Desert National Park, Jaisalmer (Raj.) ii. Kanha National Park, iii. Mandala and Balaghat (M.P.)
8. Great Indian Bustard (*Choriotis = Ardeotis nigriceps*) Long neck, long bared legged, ground bird.	i. Desert National Park, Jaisalmer (Raj.) ii. Great Indian Bustard Sanctuary (Maharastra) iii. Karera Sacntuary (M.P.)
9. Kashmir Stag/Hangul (Started 1970) (*Cervus elaphus hanglu*)	Dachigam Sanctuary/National Park, Srinagar (J.K.)
10. Indian Crocodile (Started 1974) (*Crocodilus palustris, C. porosus*)	i. Bhitar Kanika Sanctuary, Cuttack (Orissa) ii. Nagarjuana Sagar, Srisailam/Ikshawaka Sanctuary, Guntur (A.P.)
11. Wild Buffaloes	Manas Sanctuary (Assam)
12. Pelican and Marine Bird.	i. Kelameru Bird Sanctuary (A.P.) and ii. Calimere Sanctuary (T.N.)
13. Indian Bison (Gaur)	i. Bandipur Sanctuary (Karnataka), ii. Annamalai Sanctuary (T.N),
14. Lion Tailed Macaque	i. Annamalai Sanctuary (T.N), ii. Silent Valley National Park (Kerala)
15. Wild Dogs	Kanha National Park,
16. Marine Invertebrates	Gulf of Mannar
17. River Dolphin (Platinisia gangetica)	Vikramshila (Bihar),another coming up in U.P. Between Bijnor and Narora barrage.

Gradients of Biological diversity

Besides the aquatic, arid and semiarid habitat, biodiversity represents clearly latitudinal and altitudinal gradients. There is trace or little biodiversity area at poles. It increases in temperate zones but reaches.the maximum in tropical rain forest zones. This is because of the fact that the tropical rain forest zone has favourable environmental conditions for *speciation* and also for supporting both variety and number of organisms. On the contrary reversal conditions exists in temperate areas specially during cold season only but very harsh conditions prevails in arctic regions more or less throughout the year. There are 118-236 / 0.1 habitat in tropical forest and 21-48 species/0.1 habitat in temperate forests. The number of species would be 0.0-10.0 in artic zones. Similar interesting correlation exists also in other taxonomic groups like ants, birds, butterflies, moths etc. species diversity decreases. when we move upward to a high mountain, simply because of the drop in temperature (lapse temperature being 6.5. C for 1 km or 1000m) and greater seasonal variability. The above natural biological phenomena should not be confused with complexity and heterogenecity of the physical environment, which is largely responsible for increasing the complexity and diversity of flora and fauna of a particular region.

Biodiversity—Its Economic Role

Biodiversity in nature provides economic help to human being.

(i) **Source of food :** There are more than 3000 species of food plants. Out of these species only 150 species have been used for commercial purposes. 85% of the total food output is produced by less than 20 species. Out of this two third of food products is being produced by three carbohydrate rich crops e.g. Rice, Corn (Maize), Wheat. Much more utilization of food yielding plants has to be more to remove hunger, and death due to want of food.

(ii) **Source of fibers :** Fiber yielding plants are an integral part of biodiversity e.g. Agave (Sisal), Hemp, Rosella, Sunn, Jute, Flax, Cotton, Abaca, (manila hemp) and coir. It is necessary to find out new superior quality of fiber yielding plants to generate economic growth in our country.

(iii) **Source of Oils and Fats :** Oils and Fats yielding plants are soyabean, Coconut, Cotton seeds, Sunflower and Peanut etc.

(iv) **Drugs and medicine :** There are plants which produce drugs and medicines. Rosy Periwinkle (*Catheranthus roseus* = *Vinca rosea*) yields alkaloids (vicristine and vinblastine) which are very much useful for treatment of leukemia as stated by specialist. The same are now being used. There are other plants which derive drugs e.g. Morphine (*Papaver somniferum* for removing pains), Quinine (from bark of *Cinchona ledgeriana* for the treatment of malaria), taxol (from bark of Yew, *Taxus brevifolia* and *Taxus baccata* used sometimes for the treatment of cancer), reserpine (from *Rauwolfia serpentina* used for treatment of blood pressure). There are many other medicinal plants used .for the treatment of human being. The fact remains 25% of all drugs are being collected from 120 species of plants. Traditional system of medicine throughout the world uses thousands of plants for the treatment of various diseases. Various synthetic products are being produced from plant chemicals and named as botanochemicals.

(v) **New varieties :** Some domesticated species having commercial value are being improved for various traits, especially disease resistance by crossing them with wild varieties (relatives). Rice was made resistant to late blight (trait from *Solanum demissums*), potato mosaic virus and leaf roll virus (trait from *Solanum acaule*) etc.,

(vi) **Aesthetic value of Biodiversity :** Biodiversity has got aesthetic value and attraction value hence people moves around the world to see and enjoy the flora and fauna in different places. Eco-tourism, bird watching, watching of wild flora and fauna, pet keeping and gardening since ancient period are being practiced and out of this crores of money is being earned. It is an integral part of our national economy. Besides the above it is helpful to protect our natural heritage. It may be stated here that to visit Galapagos Islands people pay 40$ per person. Similarly in India to see tiger at Jim Corbet National Park individuals have to pay Rs. 100 as entry fees. Visitors to Kashmir, Darjeeling and such other hilly areas in India are being amazed to visualize the scenic beauty created by its Biodiversity.

(vii) **Ecosystem services :** Maintenance and sustainable utilizations of useful products and services of various ecosystems and also individual species require the presence of Biodiversity. It may be mentioned here that forest and oceanic systems regulate climate and micro climate, maintain gaseous compositions of atmosphere. The deteriorating condition of many natural and cultural heritage sites is due to the unnecessary human interference, damage on the Biodiversity patterns exists in a particular region. If this is allowed to continue then the protected natural, cultural heritage sites, would be disturbed, damaged seriously. To regulate, control, manage natural pest biodiversity patterns should not be disturbed specially for the maintenance of the population level of various species e.g. pollination by birds, insects. This is also necessary for the maintenance of food wave, conservations and purifications of water, formation and protection of land mass etc.

(viii) **Social, Cultural, Educational Benefits** : Since pre-historic period people have established link and or developed religious, social, cultural values with species specific flora and fauna for their own existence. Majority of the Indian homes have specimens of Tulsi, Neem and Bel etc. Trees of Pipal (*Ficus religiosa*) and Khejri (*Prosopia cineraria*) and *Ficus bengalensis* are held sacred. They are worshipped and planted again if died. Many birds are considered sacred. Snakes are worshipped. Each and every countries and states feel pride in recognizing a particular animal and plant as a national symbol. We also cannot undermine the economic cultural value of Flora and fauna exist in a global village.

Globalization and threats to Biodiversity

I have already stated that due to various factors sponsored by human being, natural heritage throughout the world is under threat. As a result; number of species either becoming endangered or being extinct and Biodiversity of the whole world is constantly threatened. The factors held responsible for such threats are loss of habitat and fragmentation, disturbance and degradations, pollutions, introductions of exotic flora or fauna, over used and over exploitation, industrializations, intensive agriculture practices and changing forestry patterns, land used patterns exploitation of the water bodies.

(i) **Habitat loss and Fragmentations :**

Population explosion, urbanization, nuclear.explosion, industrialization require additional land every year throughout the world. To meet the requirement of additional land destruction or fragmentations of nature is necessary. The destruction or fragmentations of natural habitat is done through filling of wetland, ploughing grassland, cutting down trees, burning some areas of vegetation, conversion of agricultural land, for setting up industry, housing projects, multiplex and over use of pesticides, polybags, etc. Loss of habitat of (both flora and fauna) results in annihilation of species of endemic plants, macro and micro-organisms and forcing out of animals which in alien land and die out within a short span of time. Due to the fragmentations of habitat e.g. forest land mass surrounded by orchards, plantations, crop land in urban and rural areas result in disruption of complex interruption and intra-actions amongst various species, destruction of various species bed in the cleared regions, annihilations of species, restricted only to deeper undisturbed areas/parts of forest and reduction of numerical strength of species in the habitat fragments.

(ii) **Degradation and Disturbance :**

Natural, man made and also human related disturbance of the ecosystems result in degradation of habitat and loss of biodiversity. Such natural or man made factors include fire, cutting of trees, collection of litter locust attack, pest infestation and such other factors etc.

(iii) **Pollution :**

Use of the unnecessary and excessive pesticides and other poisonous chemicals have already polluted both surface water bodies and underground water bodies. Many chemosensitive macro and micro organisms have already disappeared. There is a tendency of their biomagnifications, which result higher with the rise in the tropic level. It has resulted in drastic decline in the population of falcons and fish consuming birds. Runoff from fertilizer rich fields causes nutrient enrichment of water bodies. This phenomenon is called eutrophication. Besides the above factors sewage and other organic remains also result in eutrophication. Due to the additional dense growth of flora and fauna followed by depletion of oxygen death of flora and fauna will occur. If heavy metals including lead are poured into water systems it will lead to death of animal due to pollution. Ducks, Cranes, Swans and Teals and such other water birds die of lead poisoning. Lead poisoning from industries have killed many micro and macro fauna, even cattle. The air pollutant causes death of sensitive plants. Radiations are also equally harmful to both plants and animals. Spill over of oil in seas and other water bodies causes death of various algae, fish and sea birds.

(iv) **Over Exploitation :**

Excessive and over exploitation of a species which may be plant or animal reduces size of its population. If such things continue for long time it will vulnerable to extinction (e.g. hunting and killing of animals for pleasure and also for commercial purpose). Collection of plants for medicinal and commercial use, may lead to extinction of such species.

(v) **Intensive Agriculture Practice :**

Expansion of agriculture practice at the cost of wetlands, forest and grassland cause destruction of habitats. As a result, extinction of species occur. Intensive agriculture is sometimes based on a few high yielding varities of crops. As a consequence there is reduction of genetic diversities which increases vulnerability of the crop plants to sudden attack by pests and pathogens e.g. at one point of time more or less 308 varities of maize were growing in USA, but the number is reduced to 12 only. Similarly in Philippines, the number of rice varieties grown before 1970 were 3500 now their number has fallen to 5 only.

(vi) **Cultivation or Introduction of Exotic Species :**

Various types of non-native or alien species are cultivated for economic reasons. They become invasive and drive away the local species. As a result the local species become endangered or become extinct species have proved harmful to both aquatic and terrestrial ecosystems. Island eco-systems are most valuable because of small size and small number of species.

(a) Nile perch (a predator fish) was once introduced in Victoria Lake of South Africa. It killed and eliminated several native species.

(b) Water hyacinth (*Eichhornia crassipes*) was introduced in Indian water bodies to check and reduce pollution. It has clogged water bodies resulting in death of several aquatic animals and plants.

(c) *Lantana camera* has driven away many species in forest of Uttar Pradesh and Madhya Pradesh. *Eupartorium odoratum* has reduced the population of *Tectona grandis* in North East region of India.

Extinction of species

It is a process of total elimination or drying out of species from the earth.

Susceptibility to Extinction : A species becomes prone to extinction due to two categories of attributes, drastic environmental changes and due to population characteristic. Population traits which make a species susceptible to extinction are :

i. Large body size e.g. elephant, rhinoceros, bengal tiger, lion
ii. Low reproductive potential e.g. blue whale, giant panda.
iii. Small population size.
iv. Higher status of tropic level e.g. bengal tiger, bald eagle.
v. Fixed migratory route and habitats e.g. blue whale whopping crane
vi. Small geographical range e.g. woodland caribon.
vii. Island species viii. Lack of genetic variability
ix. Inability to change over to alternate foods.

Features of extinction

Extinction is of three type i.e. i) Natural extinction ii) Mass extinction and iii) Anthropogenetic extinction.

i. Natural Extinction :

The background of natural extinction is a very slow process of replacement of existing species with the better adopted species due to alternate evolution, changes in environmental conditions, predators and diseases, a small size of population is likely to become extinct sooner than that of the large size of the population due to in breeding depression which reduces genetic variability and normal population fluctuations during drought, harsh water and severe summer. Extinction vertex is a combination of demographic and genetic factors.

ii. Mass extinction :

Catastrophes have struck the earth many times in the past, which resulted mass extinction. A mass extinction took place about 225 million years ago in permion when 90% of shallow water marine invertebrates disappeared. Such factors repeated again in between cretaceous and tertiary period when Dinosaurs and a good number of other organisms disappeared. It is also called K-T boundary. It is a fact that during Pleistocene, Wooly Mammoth, Mastodon, Giant Sloth and many other mammals became extinct. Extinction of species during Pleistocene is perhaps due to advance and retreat of ice sheets coupled with over-exploitation by hunters. K-T boundary extinctions are related with the deposits of iridium which is otherwise rare on earth surface.

iii. **Anthropogenic Extinction :**

These are caused because of the human activities like settlements, hunting, habitat destruction, over use and over exploitation etc. The World Conservation Monitoring Center has found out that since 1,600 A.D. the earth has lost 533 animal species (mostly vertebrates) and 384 plant species (mostly flowering plants). The reasons of 75% these extinctions are because of direct human interference. It has been established that Dodo (*Raphus cucullatus*) and Taswania Wolf (*Thylacinus cyanocephalus*) have been lost from earth surface due to hunting by humans. Commercial use and exploitations has brought several species to the brink of extinction.

The present form and rate of extinction is 1000-10,000 times the rate of normal extinction.

(i) In each hour tropical forest is loosing 2-5 species per hour of 14-40,000 species per year. Ten high diversity of localities of tropical forest covering 3, 00,000 km. 2 are area likely to lose 17,000 endemic plant species and 3,500,000 endemic animal species in the coming days.

(ii) If the current rate of extinctions of species is being allowed to continue, 50% of the species are bound to die out by the end of 21st Century.

Role of International Union of Conservation of Nature And Natural resources (IUCN)

International Union of Conservation of Nature and Natural Resources which is now known as world conservation Union (WCU) having its headquarters at morges, Switzerland maintains a Red Data book or Red list which is a catalogue of taxa facing risk or chances of extinction of species. Threatened species is the one which is bound to become extinct if not to understand, analyze, interpret its full Biotic potential by providing protection from exotic species / human exploitation or over use of habitat, deterioration and or depletion of food etc. Red data book was prepared initially during the year 1963. The 2000 Red list has made assessment of 18,000 species out of which 11096 species (5485 animals and 5611 plants) are included on the threatened list in the whole world. The basic aim and objective of preparation of red list is to

i) Create an awareness to the degree of threat to Bio-diversity, ii) provide a global index about already declining phase of Bio-diversity. iii) Identification, documentation, cataloguing of species at high risk of extinction on its zones. iv) Preparing conservation priorities and help in conservation action. v) Information about international agreements like convention on Biological Diversity and, CITES (Convention on International Trade in Endangered species of wild fauna and flora) there are eight categories of species enlisted in the red list

(i) **Extinct species :**

The taxon has completely been wiped out from the earth e.g. Dodo.

(ii) **Extinct in Wild :**

The texon is absent in any of its natural or expected habitats in the wild. A number of even domesticated animals and plants have become extinct in the wild.

(iii) **Critically Endangered :**

The taxon is in high-risk zone, facing extinction in the wild and can become extinct any moment in the immediate future. The member of such species in the world is 925 animals and 1014 plants (10% mammals, 9% birds, 15% reptiles, 16% amphibians and 16% angiosperms) the number of such critically endangered species exist in India is animals 18, plants. 44 respectively e.g. *Sus salvanius* (Pigmy Hog) *Berbers nilghiriensis.*

(iv) **Endangered :**

It is placed in the high risk zone facing high risk of extinction in the wild with in a short span due to decrease its habitat, excessive predation or poaching and or killing. The percentage number of endangered species in the list of threatened ones is 19% mammals, 17% birds, 21% reptiles, 22% of amphibians and 19% angiosperms. In India the number of such species is 54 animals and 113 plants e.g. *aiburus fulgent* (Red Penda), *Bentinckia micoberica,* others species are blue whale, Largest Lemur idri of madagaskar, Asiatic, wild Ass (*Asinus Hemionus Khur* now restricted to Rann of Kutch) and lioned tailed Macaque (in Diptiro carpus forest of south India with total number of only 195).

(v) **Vulnerable :**

The present population as it exists right now is sufficient but is undergoing depletion due to some factor or factors as a result they are facing risk of extinction in medium term future. Out of the total threatened such specie, 35-51% are vulnerable (34% mammals, 48% amphibians, 36% birds, 43% reptiles and 51 % angiosperms) Their number in India is 143 animals and 87 plants e.g. *antelope cervicaora* (Black Bug, Indian Gazelle, *cupressus cashmeariana*).

(vi) **Lower Risk :**

They are threatened species, which 'have lower risk of extinction, and they require small attention so that it can flourish properly. The percentage number of such species out of the total threatened ones is 37% mammals, 38% birds, 21% reptiles, 16% amphibians and 14% angiosperms. In India the number of such species is 109 animals and 73 plants.

(vii) **Data Deficient :**

The data for calculating and or marking direct or indirect assessment of risk of extinction is deficient. It requires much more research work to make the data efficient.

(viii) **Risk of Evaluation (Not Evaluated) :**

The taxon has not been evaluated to avoid the risk of extinction. It may be mentioned here that Red List uses a set of criteria, which is applicable to all the species and covered all the regions of the world. Although there are certain categories which were recognized earlier. They are (a) Rare species (R), (b) Intermediate species :

(a) **Rare species (R) :**

Rare species are naturally having small population, either localized or thinly scattered, which are always at risk from pest predators pathogens/exotic species clouded leopard (*Neofelis nebulosa*) of Himalayas is a rare species because of hunting, killing, poaching and due to loss of habitat. Hawaiian Monk Seal (*Monochus schauinslandil*) is found only in six islands. Great Indian Bustard (*Ardeotis nigriceps*) is a rare species of bird found in different parts of Gujrat and Rajasthan. But due to hunting killing and poaching and destruction of habitat it became endangered.

(b) **Intermediate species :**

The species belong to this category are facing the danger of extinction but the exact reason of such factors is not yet known e.g. 3 banded Armadillo of Brazil, Short Eared Rabbit of Sumatra, Mexican prairie Dog etc. As soon as the specific information is gathered about the actual status, the species is placed in one of the above categories e.g. Snow Leopard (*Leo uncia*) was placed as intermediate species in 1968 and became endangered in 1970.

Globalization and Strategies of Conservation of Biodiversity

Now the world is nothing but a global village. Due to globalization the biodiversity is under tremendous pressure due social, political, economic, trade and commercial, use of nuclear weapon, and such other many factors. Since biodiversity is facing various constraints our natural and cultural heritage is also being threatened. So to preserve the natural and cultural heritage of the world, conservation of biodiversity is necessary as it is very much important at every hierarchical level-genetic diversity (gene pool), species diversity, community and ecosystem diversity etc. All the above factors are being threatened by the reduction of space, smaller and fragmented habitats, over use and over exploitation of resources by humans, man made eco-system, human sponsored eco-system, changes of climate, increase of pollution level and invasion of exotic species. It is important to mention here that the present human population is directly and indirectly dependent on biodiversity and deriving economic, socio cultural, functional, remote and aesthetic benefits. It is equally important that biodiversity is properly conserved and preserved in all its forms and in good forms for the future generations of the human being. As such nothing should be done which may reduce the degree and amount of biodiversity, since the intricacies and functioning of the nature are not yet known to us That is why degradation and destruction of habitats should be prevented as far as practicable and definitely not as the cost and damage of biodiversity conservation in a global village. It means protection, upliftment and social and scientific management of biodiversity so as to maintain it at its optimum level and plan out and derive sustainable benefits for the present and also to plan out future strategies plan.

What should be the pro-active strategy?

i) All the threatened species should be properly conserved. ii) Priority may be given to such species belonging to monotypic genera, endangered over vulnerable, vulnerable over rare and rare over other species. iii) All the old and new varieties of food, forage and timber plants, livestock, aquaculture animals and microbes are to be conserved. iv) Wild relatives of all the economically important species to be identified and are to be conserved in protected place. v) Critical habitats for feeding/resting/breeding/nursing of each species of flora and fauna to be identified and are to be protected at any cost. vi) Resting and feeding places of migratory/ wide ranging fauna to be protected and pollution controlled and over exploitation to be properly monitored. Bilateral and multinational agreements are to be made when it is necessary .vii) National Wildlife Protection lands are to be amended suitably and enforced by all the countries of the world. (Wildlife Protection Act has been enacted in 1972 and Wildlife protection strategies have been formulated in 1983 in India). Besides the above to carry out continuous research and to monitor the strategies Wildlife protection strategies and protection programmes integrated with International programmes are being implemented in India. Wildlife Institute of India is located at Dehradun, Indian Institute of Forest Management, Bhopal, and Salim Ali Center for Ornithology and Natural history at Coimbatore, IBWL stand for Indian Board of Wildlife (established 1952). Arid zone Research Institute Jodhpur is doing lots of research work to preserve and conserve biodiversity of India. viii) Unique ecosystem will have to be preserved on priority basis (e.g. the ecosystem of pond should not be interfered by separating land bodies to that of the water bodies by elevating embankment with cement, bricks, mortar, sand etc.) ix) The reproductive dynamics of the exploited species and productivity of the ecosystem are to be determined and the exploitation should not exceed the optimum limit. x) International trade relating to Wildlife and its products to be strictly regulated. It may be stated here that India is a signatory of the Convention on International trade Endangered Species (CITES) of Wild Flora and Fauna. xi) Development of reserves protected places. xii) To regulate introduction of alien species. xii) Reduction of pollution, level. xiii) Mass awareness through different pro-people museum activities, seminars, symposiums etc.

Two types of conservation strategies are followed in situ (on site) and ex situ (off site).

In situ Conservation :

It means protection and management of important components of biological diversity through a net work of protected zones.

Protected Zones :

There are different ecological and or biographical zones where biological diversity along with natural and cultural resources are protected, managed and maintained armed with legal or other effective measures. They are delimited on the basis of biological diversity e.g. cold desert of Ladakh and Spiti, hot desert situated at Thar, Wetland at North Eastern State a Assam, Saline Swampy areas (Sunderbans, Rann of Kutch), sub-tropical forest, temperate forest, mangroves, tropical and wet evergreen forests, tropical moist deciduous forest tropical thorn, coral reefs, etc. Protected areas/zones/places include national park sanctuaries and biosphere reserves. There are 37,000 protected zones/areas/places recognized by World Conservation Monitoring Center. In India there are 581 protected areas etc. as per records, which cover 4.7% of land surface against 10% international standard. In these areas the benefit provide are;

i) Maintenance of viable populations of native species, sub species and varieties.

ii) Maintenance of genetic diversity of all the present species and varieties, resilience species/habitats/ecosystems/habitats both in number and distribution and keep check/ control on human sponsored introduction of exotic or alien species.

Biosphere Reserves :

There are multipurpose protected areas which are specially meant for preserving gene diversity in different ecosystems of various biomes and unique biological communities protecting traditional life pattern and style of tribal people, wild population domesticated plants and animals / genetic resources. In the year 1975 creation of biosphere reserves was initiated MAB programmes UNESCO and till May 2002, 408 biosphere reserves came into being 94 countries. In India there are 14 potential sites were identified in 1979 by core Advisory Group although the number was increased in subsequent years. There are 13 biosphere reserves set up by now which are also declared as National Parks. In each biosphere reserve there are;

i) Core or Natural zone no human interference is allowed and it remains undisturbed a legally protected ecosystem. ii) Buffer zone surrounds the core area and limited human activity is allowed like resource use strategies, research and education, entertainment, mass awareness etc. iii) Transition or Manipulation Zone is a peripheral part or outermost part of biosphere reserve where an effective and active cooperation is being provided the people by the Reserve Management Body e.g. settlements, recreation, cropping, forestry and other economic causes without disturbing ecosystem. There are different parts of transition zones like tourism, and restoration of forestry, agriculture.

National Parks :

National Park is a demarcated area, maintained by Government Organization and is being reserved for ensuring safety, security, protection and betterment of Wildlife. Within the park area cultivation, grazing, habitat manipulation or such other activities are not allowed. There are 89 National Parks in India, which has occupied nearly 1.1% of geographical area. The first national park of India was Jim Corbett National Park established during 1936. Some early national parks of world are Yellowstone Park (USA) and Royal Park (near Sydney, Australia).

Sanctuaries :

Sanctuaries are tracts of land with or without lake where wild animals/fauna can take refuge and can live peacefully without any interference. Some human activities e.g. collection of timber products, vegetables, harvesting of trees are allowed with some restrictions. India has 492 sanctuaries covering an area of over 3-6% of geographical area. In sanctuaries hunting of animals are not allowed.

Conservation of Biodiversity and its importance :

i) Conservation means conservation of genetic resources, species, ecosystems and landscapes, without affecting life style pattern of local populace.

ii) Restoration Biosphere reserves help substantially in restoration of degraded ecosystem and habitats.

iii) Development means to ensure cultural, social, economically and ecologically sustainable development of the people.

iv) Monitoring: Constant monitoring system is maintained to ensure conservation and development of the area.

v) Research & Development: Each and every biosphere reserve is a living laboratory supports education system and also research on various aspects of the ecosystem/biome. Research at highest level, exchange of data, information are being made at the national and global levels.

What is MAB Programme?

Man and Biosphere programme is an international biological programme of UNESCO started its functioning in India during 1986 MAB has thoroughly studied human environment and impact of interference and pollution on biotic and abiotic environments, conservation policy and national and global strategies for the present and also for the future generation to come.

- **Project Tiger :**

It was started in 1973 due to decrease in number of tiger population from 40,000 in 1900 to 1872 in 1972. The population increases .to 4511 in 1989. However, it declined to 3750 in 1993. During 2004 the population of tiger has increased.

Sanctuaries distribution of National Parks and sanctuaries of India are as follows :

ANDAMAN AND NICOBAR ISLANDS

1. Barren Island Sanctuary (Bay of Bengal)
2. Marine National Park
3. Middle Button Island National Park (Andaman)
4. Mount Harriet National Park
5. Narcondam Sacntuary (Bay of Bengal)
6. North Button Island National Park (Andaman)
7. North Reef Island Sanctuary (Bay of Bengal)
8. Saddle Peak National Park (Bay of Bengal)
9. South Button Island National Park (Andaman)
10. South Sentinel Island Sanctuary (Bay of Bengal)

ANDHRAPRADESH

1. Coringa Sanctuary (East Godavari)
2. Etumagam Sanctuary (Warangal)
3. Kawal Sanctuary (West Godavari)
4. Lanjamadugu Sanctuary (Adilabad and Karimnagar)
5. Majiara Sanctuary (Medak)
6. Ngarjuna Sagar Srishaillam/Ikshwaka Sanctuary (Guntur, Kurnool)
7. Neelapattu Sanctuary (Nellore)
8. Pakhal Sanctuary (Warangal)
9. Kinnersani Sanctuary (Adilabad and Karimnagar)
10. Kolleru Sanctuary (West Godavari)

ARUNACHALPRADESH

1. Itanagar Sanctuary
2. Lali Sanctuary
3. Mchao Sanctuary
4. Moiling National Park
5. Namdapha National Park
6. Pakhui Sanctuary

ASSAM

1. Bamadi Sanctuary
2. Garampani Sanctuary

3. Kaziranga National Park (Shibsagar and Nowgong)
4. Manas National Park (Barpeta)

BIHAR AND JHARKHAND

1. Bhimbandh Sanctuary
2. Dalma Sanctuary
3. Hazaribagh Sanctuary (Hazaribagh)
4. Nakti Darn Sanctuary
5. Nagi Darn Sanctuary
6. Palamau Sanctuary / National Park (Dalton Ganj), also part in Orissa
7. Rajgir Sanctuary

CHANDIGARH

SukhnaLakeSanctuary

DELHI

Indira Priyadarshini Sanctuary

GOA

1. Bhagwan Mahabir Sanctuary / National Park
2. Bondla Sanctuary
3. Cotigao Sanctuary

GUJRAT

1. Bansda National Park (Valsad)
2. Barda Sanctuary
3. Dhrangadhra Sanctuary
4. Gir National Park (Gir, Junagarh)
5. Jessore Sanctuary
6. Marine National Park (Jamnagar)
7. Nalsarovar Sanctuary (Ahmedabad)
8. Shoolpaneshwar Sanctuary
9. Velavader National Park (Bhavnagar)

HARYANA

1. Bhindawas Sanctuary
2. Chotala Sanctuary
3. Sultanpur (Lake) Sanctuary (Gurgaon)

HIMACHALPRADESH

1. Bandi Sanctuary
2. Chail Sanctuary

3. Gobind Sagar (Bird) Sanctuary (Bilaspur)
4. Great Himalayan National Park
5. Lippa Asrang Sanctuary
6. Manali Sanctuary
7. Pin Valley National Park
8. Shikari Devi Sanctuary (Mandi)

JAMMU & KASHMIR

1. Dachigam Sanctuary/National Park (Srinagar)
2. Gulmarg Sanctuary
3. Hemis High Altitude National Park (Srinagar)
4. Karakoram Sanctuary
5. Kistwar National Park (Srinagar)
6. Limber Sanctuary
7. Nandni Sanctuary
8. Salim Ali National Park
9. Surinsar – Manar Sanctuary

KARANATAKA

1. Anshi National Park
2. Bandipur National Park (Mysore)
3. Bannerghatta National Park (Mysore)
4. Cauvery Sanctuary
5. Gataprabha Sanctuary (Belgaun)
6. Kudremukh National Park
7. Nagarahole National Park (Coorg)
8. Pushpagiri Sanctuary
9. Ranganathttu (Bird) Sanctuary (Mysore)
10. Sharavathi Valley Sanctuary
11. Shettithalli Sanctuary

KERALA

1. Eravikulum National Park (Idukki)
2. Idduki Sanctuary (Idduki)
3. Neyyar Sanctuary
4. Parambikulum Sanctuary
5. Peppara Sanctuary
6. Periyar National Park (Idduki)
7. Silent Valley National Park (palaghat)

MADHYAPRADESH AND CHHATTISGARH

1. Bagdar Sanctuary
2. Bandhavgarh National Park (Shahdol)
3. Bhairamgarh Sanctuary
4. Fossil National Park
5. Gandhi Sagar Sanctuary
6. Madhav National Park
7. Indravati National Park (Bastar)
8. Kanger Ghati National Park
9. Kanha National Park (Mandla and Balaghat)
10. Karera Sanctuary/Great Indian Bustard Sanctuary
11. Madhav National Park (Shivpuri)
12. National Chambal Sanctuary
13. PannaNational Park (Panna)
14. Pench National Park
15. Sanjay National Park (Sidhi and Surguja)
16. Satpura National Park (Hoshangabad)
17. Singhori Sanctuary
18. Tamor Pingla Sanctuary
19. Udanti Sanctuary
20. Van Vihar National Park (Bhopal)

MAHARASTRA

1. Bor Sanctuary
2. Chandoli Sanctuary
3. Chaprala Sanctuary
4. Great Indian Bustard Sanctuary
5. Koyna Sanctuary
6. Nagzira Sanctuary
7. Nawegaon National Park (Bandara)
8. Pench National Park (Nagpur)
9. Sanjay Gandhi National Park (Mumbai)
10. Tadoba National Park (Chandrapura)
11. Tansa Sanctuary

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MANIPUR

1. Keibul Lamjao National Park (Manipur Central)
2. Siroy National Park (Manipur East.)

MAGHALAYA

1. Baghmara Sanctuary
2. Balphakram National Park
3. Nokvek National Park
4. Nongkhyllem Sanctuary
5. Siju Sanctuary

MIZORAM

Dampa Sanctuary

NAGALAND

1. Fakim Sanctuary
2. Intanki Sanctuary
3. Pulebatze Sanctuary

ORISSA

1. Baisipalli/Mahanandi Sanctuary
2. Balukhand Sanctuary
3. Bhitar Kanika Sanctuary (Cuttack)
4. Chilka Lake Bird Sanctuary (Balagaon)
5. Debrigarh Sanctuary
6. Lakhari Valley Sanctuary
7. Simplipal Sanctuary/National Park (Mayurbhanj)
8. Palamau National Park (Also in Bihar)

PUNJAB

1. Abohar Sanctuary
2. Bir Bunnerheri Sanctuary
3. Bir gurhialpura Sanctuary
4. Bir Motibagh Wild Life Sanctuary
5. Harike Lake Sanctuary

RAJASTHAN

1. Desert National Park (Jaiselmer and Barmer)
2. Jawahar Sagar Sanctuary
3. Keoladeo / Ghana Bird Sanctuary National Park (Bharatpur)
4. Mount Abu Sanctuary
5. National Gharial Sanctuary
6. Ramgarh Sanctuary
7. Ranathambore National Park (Savai Madhopur)
8. Sariska Sanctuary / National Park (Alwar)
9. Van Vihar Sanctuary

SIKKIM

Khangchendzonga National Park (Gangtok)

TAMILNADU

1. Anamalai Sanctuary (Coimbatore)
2. Guindy Sanctuary (Madras)
3. Kalakad Sanctuary
4. Marine National Park (Gulf of Mannar)
5. Mudumalai Wild life Sanctuary (Nilgiri)
6. Nundanthurai Sanctuary (Tiruenelvelli)
7. Pulicat (Lake) Sanctuary

TRIPURA

1. Gumti Sanctuary
2. Rao Sanctuary
3. Sepahijala Sanctuary
4. Trishna Sanctuary

UTTARPRADESH AND UTTARANCHAL

1. Binsar Sanctuary
2. Chandraprabha Sanctuary (Varanasi)
3. Corbett National Park (Nainital). First to be established
4. Dudhwa National Park (Lakhimpur Kheri)
5. Hastinapur Sanctuary
6. Kedamath Sanctuary
7. Nanda Devi National Park (Chamoli)
8. National Chambol Sanctuary
9. Rajaji National Park
10. Valley of Flower National Park (Chamoli)

WEST BENGAL

1. Ballarpur Sanctuary
2. Garumara Sanctuary
3. Jaldapara Sanctuary (Madirahat, Jalpaiguri)
4. Narendrapur Sanctuary
5. Neora Valley National Park
6. Senchal Sanctuary
7. Singhalila National Park
8. Sunderbans Tiger Reserve / National Park (24-Parganas)

Biosphere Reserves of India

1. Nilgiri Biosphere Reserve (Kerala, Karnataka and Tamilnadu) - First to be established in 1986.
2. Nanda Devi Biosphere Reserve (Uttaranchal)
3. Nokrek Biosphere Reserve (Tura Range, Meghalaya)
4. Great Nikobar Biosphere Reserve (Andaman and Nicobar)
5. Gulf of Mannar Biosphere Reserve (Tamilnadu)
6. Manas Biosphere Reserve (Assam)
7. Dibru Saikhowa Biosphere Reserve (Assam)
8. Dehang Debang Biosphere Reserve (Arunachal Pradesh)
9. Sunderban Biosphere Reserve (West Bengal)
10. Simlipal Biosphere Reserve (Orissa)
11. Khanghendzonga Biosphere Reserve (Sikkim)
12. Pachmari Biosphere Reserve (Madhya Pradesh)
13. Agasthyamalai Biosphere Reserve (Kerala)
14. Thar Desert Biosphere Reserve (Rajasthan)—To be established soon.
15. Little Rann of Kutch Biosphere Reserve (Gujrat)—To be established soon.

Sacred Places (Forest, Lakes, Ponds, Rivers) :

There are places which are held sacred e.g. forest, lakes, ponds, rivers and many flora-fauna associated with the sites preserved to show respect to god and goddess.

In India many animals which are held sacred due to their association with myth, belief, rites and rituals, religious practices and also to their association with god or goddess (e.g. owl, peacock, ox, tiger, swan, snakes) and are protected by the people. In the temple premises no one is allowed to cut trees or haunt animals. Temples build by tribal are found surrounded by Deodar forests and other trees in Jaintias and Khasis in Meghalaya and these are protected as these are held sacred. As a consequences many endemic species which are rare or have become extinct in other part of the country can be seen to flourish here - and it is kind of conservation of biodiversity in India. I can cite an example here that the Bishnois of Rajasthan protect *Prosoois cinerio* and Black Buck as a part of their rites and rituals. Similarly different water bodies are held sacred and people take bathing e.g. Gangasagar, Tribeni Sangam, Haridwar, Manas Sarabor, Ganges, Kunti Ghat, Kecheopalri and such other many places. Similarly many ponds, lakes and other water bodies are dedicated in the name of god and or goddess and are protected as a part of there religious activities. Through out India some faunas are held sacred and are partly protected. Although now cutting of trees is an offense under law and in exceptional situation it is only permitted by Government as per law the land.

Ex-Situ Conservation:

Ex-Situ Conservation means——preservation of rare flora and fauna in places outside their natural homes. It also includes off site collections of and gene banks. Above two are also a source of genetic materials for breeders and genetic engineers.

1. Offsite Collection :

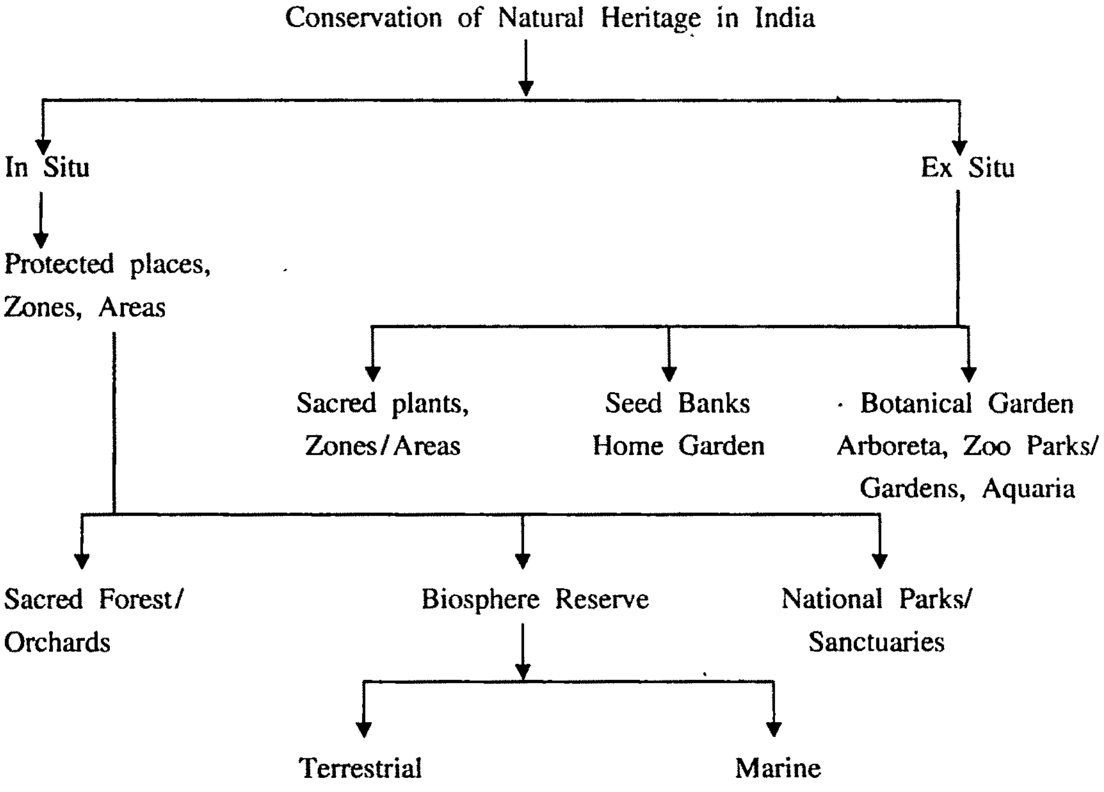
They are collections of domesticated as well as live species in botanical gardens, zoos, arboreta etc. At present there are more than 1500 botanical gardens and arboreta (gardens with tress and shrubs) having more than 80,000 species. Some of them have seed banks, tissue culture facilities and other having *ex — situ* technologies. The number of zoo parks and zoo gardens is more than 800. They have about 3000 species of mammals, birds and reptiles and amphibians and most of them have captive breeding programs. But now captive breeding is restricted to those cases where the number of surviving individuals is so small that there is no factual and / or realistic chance of in-situ survival. As soon as the number of species increases in captive breeding, they are selectively released in the wild. Through this method Californnian Candor, *Gymnogyps clifornicus* and Black - Footed Ferret (*Mustela nigripes)* have been protected from extinction. Similarly Ginkgo Trees (*Ginkgo biloba*) has been saved by selective breeding followed by channeling into trade for eco -tourism. Hence offsite collections can be used to protect / restore / restock depleted populations, reintroduce species in the wild life and also to restore degraded habitats.

2. Gene Banks :

They maintain stocks of viable seeds (seed banks), live growing plants (orchards), tissue culture and frozen germplasm with the full range of genetic diversity .Under gene banks there are *Seed Banks* which are of two types

a) Orthodox seeds

b) Recalcitrat seeds


Conservation of Natural Heritage in India
In Situ
Ex Situ
Protected places, Zones, Areas
Sacred plants, Zones/Areas
Seed Banks Home Garden
Botanical Garden Arboreta, Zoo Parks/ Gardens, Aquaria
Sacred Forest/ Orchards
Biosphere Reserve
National Parks/ Sanctuaries
Terrestrial
Marine

Hot Spots :

The areas having high density of biodiversity or megadiversity which are the most threatened one is called Hot Spots. Today the number of Hot Spots identified by ecologists is. 25 covering an area of 1.4% of land surface with about 20% of human population living there. In India there are two hot spots – North East Himalays and Western Ghats. India is even otherwise of a country of megadiversity with 2.4% of land areas and having 7.7% of global diversity. There are 12 such countries with 65% of total biodiversity zones.

Efforts for Conservation of Biodiversity in International Level

Earth summit at Rio de Janerio (1992), Brazil, promoted convention of Biological Diversity (CBD), was duly signed by 152 nations for the conservation of Biodiversity. Its recommendation came into effect on and from 29th Dec., 1993. India became a party to this in May, 1994. Different suggestions were adopted. i) Adoption of ways and means to conserve biodiversity. ii) To manage biological diversity for sustainable use. iii) To ensure equitable sharing of benefits from biological diversity including the utilization of genetic resources.

Agenda 21 is considered as a product of earth summit is a blue print of total outline planning for encouraging sustainable development of biodiversity through formulation economic, social, cultural, educational and environmental strategies in the 21st century. Non-Governmental Organization (NGOs) like green peace provides intonational support for conservation and presentation of Biodiversity. World Conservation Union (former IUCN) provides guidance and leadership, and expertise in different areas of conservation. WWF–World Wild Fund, CITES - Conservation in International Trade in Endangered Species helping a lot in restricting, poaching, killing, haunting and loss of rare species. Restricted practices have been imposed on trading of animal products in belief to have saved the elephant, tiger, lion, and rhinoceros, from extinction. Man and Biosphere (MAB) programme, World Heritage Conservation, Ramsar (Wetland Conservation) and establishment and maintenance by different countries substantially help in conservation of biodiversity of the world as well as India.

Conservation of Biodiversity in India :

The protection of wildlife has a long tradition in the history of India. Wise use of natural resources was a prerequisite for many hunters–gather communities since 6000 B.C. Extensive deforestation, impact and influence of globalization in recent years made a substantial contribution in this direction. The enforcement of a National policy for Wildlife Conservation in 1970 and the enactment of the Wildlife Protection Act, 1972, Project Tiger (support from WWF (IBWL 1972), Crocodile Breeding and Management Project with technical assistance from UNDP/ FAO etc. are now being implemented in India for conservation of biodiversity in India.

In ancient times animals were protected as essential parts of religious practice. The importance attributed to religious in Indian civilization is so great that it has some times surpassed, the attention given to mere mortals. The same spirit has survived to some extent to this day also – especially in rural areas many of the religious practices that make up the immense Indian sub-continent. Besides, in many cultures, animals or some of them played a mythical and symbolic role in prehistoric period, though it is not absolutely clear whether the prehistoric population and civilization were the direct forerunners of historical Indian society. In the Indus valley civilization some seals along with some animal figures have been unearthed, but these have not been deciphered as yet. But it is clear, however, that the vast majority of the representations were animals rather than human being. In rock paintings animals and plants were depicted.

From this period and onwards nature was worshipped as a manifestation of God and preservation of nature was an integral part of human responsibility. Large-scale destruction or killing of animals was considered illegal. The ashrams (hermitages) of Brahamanas were the Sactum Santorum for wild life, where plants as well as animals flourished undisturbed. Temples and other religious structures were considered as protected places, and large and small trees enveloped the areas.

Hunting or killing of animals in the environs of a temple was completely prohibited and these measures had rigorous sanction. Indian mythology, art and literature are bound up intimately with their wild life, as testified by a great number of sacred animal representatives like the elephant headed Ganesh, rhino-headed varahavatar, the turtle shaped kurmavatar and monkey faced Hanuman, the lion headed Narashinghavatar etc. In course of time, there was an increasing pressure on wild life, till forest management laws were framed and enforced by the Maurya kings. The Arthasastra of Kautilya enumerates, for example eight forest division, (VISHNUDHARMOTTARA) of which the gajavans (elephant forest) the dense forest which sheltered elephants, were considered very important, since elephants were the most popular factor that determined the rise and fall of ancient empires.

Along with other animals these forest sheltered panther, tiger, lion, rhinoceros, wild buffalo, gaur, yak, stag, iguana, crocodile birds and numerous other animals. Game laws were rigorously enforced during the reign of Chandra Gupta; the Maurya. There are Kupyadhyaksha who was incharge of forest products. Wild animals and forest products are strictly protected, and only the king had the privilege of hunting, once a year with his courtiers and members of family. Magsthanes (Mac Crindle, 1962) has drawn up a detailed graphic account of royal chase of Chandra Gupta, the Maurya, but Asoka (B.C. 296-277) abolished the laws of his grand father. He worked out the game laws even more elaborately and stringently. He explained them as dharma niyamas (duty of moral discipline) on the principles of ahimsa (not molesting and not causing harms by thought or dead to any being), which not only prohibited the killing of some species of bird, fishes and wild animals throughout the empire, but also protected them as pradishtabhayamahayavanavasinam chamringapasu-pakashimatasyanam in wildlife sanctuary.

Emperor Asoka (about 246-277 B.C.) who was converted to Budhism (in approximately 252 B.C.) had a number of edicts engraved and set them up in various places through out the Empire. In this proclamations he declared that he himself had renounced the pleasures of haunting and he encouraged his subjects to follow this example.

He ordered that the slaughter of animals should be much curtailed and to set a precedent he prohibited the daily killing of "Several hundreds of thousands of beast" for the imperial palace. Only three might be killed for his table "two peacock and a gazelle" and even these not "constantly?" In a later edict he went so far as to sate that he had renounced flesh-eating for himself and had become a vegetarian. Even if all the sovereigns of ancient India did not intimate Asoka they did at least found hospices for old and sick animals. These rulers had maintained zoological garden stocked by hunters and professional fowlers: and reserves where animals lived without constratint and where visitors were admitted to wonder about freely.

Asoka in the stone pillar Edict V prohibited the killing, for the purpose of eating, of birds like parrot, mynah, red crested pochard, brahmini duck, swan, crane, stork, vulture, peacock etc., and mammals like bats, porcupine, squirrel, stag, rhinoceros etc., killing or hunting of primates and carnivores on specific days, of totaling days in a year, was strictly prohibited. The forest organization under the Guptas (A.D. 400-600) was due to Sukracharya, who greatly improved the forest administration and certain laws were strictly enforced at that time.

The king alone had the right to kill, but subsequently for him also killing a peacock and other species of birds was prohibited. Royal elephant crops and camel were allowed to be camped inside the forest but not the infantry or the cavalry. The flora and fauna depicted on Sanchi stupa, the Ajanta cave and the Ellora cave and the Khajuraha temple are eloquent testimony of the care taken of the flora and fauna during that period.

In those days human society was divided into different classes. The animal world also was organized according to a similar social system, a regal system. It was assumed that both man and animal obey similar laws, though the welfare of man was the basic criterion. As the possible host of migratory soul the animal was held to posses the same feelings as a man and the same ability to express them. Its acts, like those of a man, are good or bad, in terms of reduction of the sun of Karman, either holding the soul prisoner in the inferior body or permitting it to be reborn in higher state.

When from the sixth century B.C. Buddhism began to spread throughout India, it perpetuated the same ideas and incorporated them into the Buddhist system founded on charitable relations between all begin. The stories of lives (jataka) of Buddha offer explicit proof of this. This jatakas were compiled in about the second century B.C. and since then, these were illustrated in a delightfully spirited fashion. At Bharut and other sites we find representations of innumerable animals which seem to act, speak and behave like the men they are shown with. The Buddha himself was incarnated in many birds and animals and the list of them is very significant-fish, crab, cock, woodpecker, partridge, francolin (the black partridge of Persian and northern India), quail, pigeon, goose, crow, zehu, buffalo, monkey, elephant, antelope, deer and horse.

Professions which entitled the killing of animals were forbidden to Brahmins, priests by right of birth. Thus they could not become labourers, since in plaughing the soil they would kill insects and other small living creatures, nor could they became hunters fisherman or fowler butchers or even tanners. Such people were held in as great contempt as hangman, grave-diggers and those conducting funerals. Slaughter houses were banished to sites beyond a city's limit, though perhaps, in part of hygienic reasons. Indeed everything relating to death of animals was condemned.

The condition of the Indian wild life started deteriorating from about the end of Hindu period in Indian history and was accelerated with the beginning of the Muslim rule. Conservation and preservation of the wildlife was completely neglected and ignored till the Mughuls came to power in A.D. 1526. Some records of hunts of the late of 14th century are revealing. According to Zafarnamah, Timur once killed several rhinoceros with swords and spears on the frontiers of Kashmir. The Jariki-Mudarak-Shahi states "in the month of

Zi-i-Kada of the same year (ca. 1387) he (prince Muhammad Khan) went to mountains of Sirmor (West of Yamuna) and spent two months in hunting rhinoceros and the elk.. (Ettinghausen, 1950). Babur relates in his memoires (Beveride, 1922) how he went to rhinoceros hunt on the Sawati (ca. 1519) and set fire bushes to drive out the animals and finally killed a calf.

In the mediaeval period hunting was the more fashionable method of amusement and recreation among the rulers and elites. Akbar (A.D. 1556-1605) introduced a special kind of hunting called gamargha hunt, which became very popular with the Mughal kings (Chopra, 1963). Every successive emperor and the associated nobles were interested in this sport. (Alvi and Rahman, 1968) He kept about two thousand hunting leopards (Harper, 1948) a species, which, as already indicated, has disappeared from India. During this period elephant were found through out he Indo-Gangetic plains and the peninsula and their herds sometimes amounted to a thousand elephants.

(ABU-I-FAZ, 1590) ABDUL FAZAL has mentioned and recorded rhinoceros in the Sambal Sarkar of Delhi Suba during Akabar's regime (ABU-I-FAZAL).

The Emperor Jahangir (1605-1627) was, as far as we know, one of the first Indian bird watcher in modern sense. In this time lion hunting was the exclusive prerogative of the king and the elephant hunting required special permission, which was sparingly granted to only professionals. Up to the middle of 18th century the natural environment remain undisturbed. The establishment of East India Company (1701 A.D.) had provided a happy hunting ground for the colonist. The company's officer regularly used to hunt lions, which were very frequent in northern India about 200 years ago, without any restriction. Kinnear (1920) explained that during the Sepoy Munity in India (1857) Col. George Agland Smith killed more than 300 lions, of which 50 were in the Delhi district alone. By 1870, tigers had been exterminated in many parts of India. Since the 18th century and 19th century some wild animals were extinct either completely or partly due to various factors. The role of man, however, in the disappearance of so many animals from the Indian fauna had been cruelly big during the past sixty years. It may be stated here that the cult of civil disobedience, propagated by the freedom fighter during our freedom struggle and regularly practiced by diverse parties since then, had the result of generating a wholesome contempt for laws including game protection and forest laws so that killing and hunting of wild animals flourished uninterrupted and unchecked. Beside there was a very good export market at that period of such goods. The exact number of animals which were smuggled out of India, year after year is yet to be correctly known. Animals that have been extinct for the last sixty years have been edged out by human actions and also due to some topographical changes.

The persistence of belief in Indian civilization is an almost unique phenomenon, continuity from prehistoric times to the present day. Archaeology and art gives enormous evidence of the important place, which animals occupied at the core of Indian life throughout some 5000 years.

However, what is important, that there was a close association between men and to that of the animals were highly respected or even venerated. If one objects that this is an exaggeration because of India, as else where, human cruelty towards animal existed, and still exists, one must recall that in no other part of the world is there so marked a fraternity expressed in many actions beginning with the adherence to a strictly vegetarian diet as early

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as the third century B.C. and continuing with the foundation, in the second century B.C., of hospices for sick and aged animals. India, always a land of paradox, is true to itself in its attitude towards animals and plants. Indian artists have been among the most skilled depicters of animals; the created masterpiece which could never have existed without a strong bond of affection towards the plant and entire animal world and thus it may be said that there was definitely a concept of conservation of natural heritage in the past.

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CHANGING CONCEPT OF "MUSEUM" AND "MUSEOLOGY"

Mahua Chakrabarti *

The Concept of museum had grown through different stages. The word 'museum' is evolved from the Greek word *Mouseion* i.e. the throne of *Muses*, The word Muse originated from Latin: Musa, Greek : *Mousa*. There are Greek dialect forms *mosa* and *moisa*, and all three appear from an original *montya*, It generally pictured nine maidens[1], who were the daughters of Zeus, king of Greek gods, and Mnemosyne[2], the goddess of Memory. *Muses* were the female divinities, who presided over various human faculties of knowledge, history and art. In the Graeco-Roman period, the temples of Muses attained to be the focal point of erudition and seat of famous savants. Therefore, such temples of *Muses* developed as a complex of learning, teaching and research, with a good collection of manuscripts and necessary instructional materials. These came to be known as *"Mouseion"*. *Muses* are alike the Hindu deity Saraswati. *'Muse'* as verb means, "to be absorbed in one's thoughts", "engaged in meditation" .

According to the view of some scholars, the oldest museum-like organization was established in the temple of Chandra Devi Nannar. established near Ur City, the capital of Babylon.

According to the Encyclopedia Britannica, "a development toward the idea of the museum certainly occurred early in the second millennium BC at Larsa, in Mesopotamia, where copies of old inscriptions were made for use in the schools" [Macropedia, M Volume, p. 481],

Two museums, free from the influence of religion, may be cited here. The first one was a large botanical garden (350 BC) established in Macedonia by Alexander. The second was the Alexandria Library. It might have been established during 323 to 285/283 BC by Ptolemy I Soter or by his son Ptolemy II Philadelphus.

This organization developed as a great school of science or arts, very popular for centuries, attracting prominent scholars, students and researchers. Though it could not perform the standard of a museum in modern denotation, some scholars call it "Alexandria Mouseion".

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1. Calliope—the Muse of epic poetry, Clio—the Muse of history, Erato—the Muse of lyric and love poetry, Euterpe—the Muse of music (or flute), Melpomene—the Muse of tragedy, Polyhymnia—the Muse of singing and mime and sacred dance, Terpsichore—the Muse of dance and of choral song, Thalia—the Muse of comedy and pastoral poetry, Urania—the Muse of astronomy.
2. Her name is the Greek noun mnemosune "memory", which comes from mna-, an extended form of the Greek and Indo-European root men-, "to think". This is the root from which we derive amnesia (from Greek), mental (from Latin) and mind (from Germanic). The reconstructed form montya that is the ancestor of Greek *Mousa* could then mean something like "having mental power".

In ancient and medieval India, there existed 'Chitrasalas' (art galleries). 'Nilapita' (a kind of record office) 'Vithi' (gallery of portraits and pictures of heroic deeds of the royal personages), 'Prayana-yogya yantra-chitrasala griha' (a gallery. capable of moving), etc. Example of the Saraswati Bhandar (a collection of manuscripts) may also be cited here.

In China, a mausoleum was discovered in the seventies of the twentieth century .This dug in cavity, known as "Warriors' House" accommodates a vast number of terracotta figures of heroes and warriors of the Qin Dynasty (259- 210 BC).

The Shoso-in Treasure House was built close to the Todaji Temple (AD 759) in Japan. In it the whole personal collection of the former Japanese Emperor Shomu Tenno and the ceremonial objects were preserved and displayed.

Thus, the concept of gathering different relics and things related to the academic disciplines of human life helped originate the idea of propagating knowledge by such collections.

Along with the Renaissance in Europe, artistic fondness were developed; collectors were encouraged to collect objects of appreciative value. The sense of individuality was enhanced in man that helped grow individual appreciation of art. Curios, preserved in personal 'cabinets' were opened to the friends during Rendezvous".

In the seventeenth century in Europe, the word 'museum' originated to specify collections of curiosities. In Lambeth (England), John Tradescant's collection was displayed in an array, which the guests called 'museum'. The '*Musaeum Tradescantianum*' was the catalogue of this collection, published in 1656. A law was enacted in 1753, establishing the British Museum, which had some ambivalence in the use of the term 'museum'. Despite the concept of museum set to preserve and display a collection to the people was prevalent throughout the eighteenth and nineteenth centuries; museums were not for the public as these were designed to be. However, museums became the focal point of scholarship, a place of pleasure for the highborn persons, aristocrats, court-men and their friends and families, group of allowed persons likewise.

This situation could be changed only after the World War I, when under the League or Nations was created the International Museums office (IMO), the first international body of museums. It took up the duty of organizing seminars for the recovery of artifacts belonging to different nations, which have been plundered by others in course of attack, armed conflict and imperial aggression. Nevertheless, it could not perform much to the purpose stated above.

After the World War II, the United Nations Organization was formed under which the UNESCO began to function in different spheres of culture as well as museums. The International Council of Museums (ICOM) was formed, supported by the UNESCO as the main international organization for the purpose of co-operation between the museums throughout the world.

ICOM formulated the definition of 'museum' at various times to include traditional types of museums and others in different areas, which developed in the post-war period.' The definition incorporated archives, libraries, zoo gardens, botanical gardens. aquaria, nature reserves, natural, archeological and ethnographic monuments and sites of a museum nature, science centres, planetaria, etc., within the area of museums. It also imparted proper emphasis on various functions of museum leading to the fulfilment of the defined objective of museum.

The most recent definition of 'museum' (ICOM Statutes, amended by the 20th General Assembly of ICOM, Barcelona, Spain, 6 July 2001) defines :

> "A museum is a non-profit making, permanent institution in the service of society and of its development and open to the public, which acquires, conserves, researches, communicates and exhibits, for purposes of study and enjoyment, material evidence of people and their environment."

In addition to the previously noted museum-like institutions pertaining to the definition of museum, many other organizations were designated as, 'museum', such as non-profit art exhibition galleries, international or national or regional or local museum organizations, ministries or departments or public agencies responsible for museums, non-profit institutions or organizations undertaking conservation research, education, training, documentation and other activities relating to museums and museology, cultural centres and other entities that facilitate the preservation, continuation and management of tangible or intangible heritage resources, such other institutions as Executive Council having some or all of the characteristics of a museum, or as supporting museums and professional museum personnel through museological research, education or training.

From the definition, it is clear that a museum should fulfil four major criteria :

(i) It must have a permanent establishment (with specified public collection area, non-public collection area, public non-collection area and non-public non-collection area), certain rules and regulations for its administration,

(ii) It should perform defined functions (collection and storage, research and documentation, preservation and conservation, exhibition, communication and education in a recreational mode, as well as publication),

(iii) It should contain material constituents (furniture, equipment, stationary, etc.) and human constituents (organized staff pattern—administrative staff, curatorial staff, including security personnel) and

(iv) It must have a defined objective to reach.

Thus, the museum as an early twentieth century concept was the consequence of white, patriarchal, European society, rooted on values found in that society, the nature of cultural property, its possession and the benefits or preservation of chosen cultural property. By definition, then the museum itself was a biased organization of a particular society and its value.

Education was gradually becoming important in the planning of museum at the end of the 1980s and beginning of the 1990s. However, in quest of project funding along with generating income from visitors, museums discovered that entertaining the museum audiences was economically beneficial besides educating them. The educational role of museums was reshaped. Accordingly, other expertise was accepted. The traditional educator was almost removed and to some extent was substituted by project managers for programmes.

Role of the new policy of the government became to "privatize" the national museums. This has led to a change of culture. It calls for utilitarianism and a more practical and creative approach to the rôle of the museum and the composition of its staff. The size of the staff is gradually diminishing as many tasks are contacted out. Museums tend to choose a small number of more generalist workers with management proficiency, co-ordinating the work of adaptable teams of self-employed professionals. Another progress is the creation of low-level jobs particularly in the scope of collection management. The present functional level of recorders and conservators is divided in a, higher level (collection managers) and a low level (conservation technicians and documentation technicians).

The new museum culture seeks for business-oriented people. Most of the new museum-programmes were developed with cultural management and marketing as their focus. Museums offer highly valued career perspectives.

It can be noticed that the traditional concept of museum is gradually changing. Traditional museums are no longer the usual place for keeping and showing museum objects. 'Message' and 'Audience', 'Subjective Choices', Power and Politics'–as an instrument of 'society and of its development' thèse slogans delineate the modern museum. 'National Identity' is subjective message often conveyed by museums. The utilization of material culture to present subjective message is at the nucleus of what museums are, and what they do.

The long-standing .tradition that museums are apolitical and naturally apathetic has been dispelled. Every exhibit carries a message, a perspective, a position—political or else. Therefore, as in the process of denotation of national identity, museums are engaged in selective choices and the deliverance of messages with a specific outlook. Messages provided by museums hence seem unlikely to be challenged by the victory and perform as the perfect medium for the government to convey its ideas and strengthen its position in society.

Objects/artifacts of material culture make the mainstay for those messages—museums embody identity. In presenting objects/artifacts and elucidating them in a specific method, the museum makes a meaningful link between objects/artifacts and the citizens of the nation. The idea of the 'nation' made real and definite: if it is in the museum, it must be authentic.

We can cite some instances. In the 'post liberation' epoch, museums in Zimbabwe are heeded a ''central artery" fur communication and harmonizing. Moving to post conflict situations, the nation state of Namibia presents an instance of museums playing a role delineating post-colonial national identity, with a special emphasis on national unity. By including a traditional Schleswig form of building in the Danish Open-Air Museum, Denmark makes a conscious endeavor to identify Schleswig and its cultural traditions as part of Danish national identity. Now, a couple of Chinese 'National Palace Museums', one in each in Taipei and Beijing represent China's national identity.

The "new" museum is defined by its socially applicable objectives and basic principles. Its work as an educational institution is directed toward making a population conscious of its identity, reinforcing that identity, and ingraining confidence in a population's possibility for development. The work of the "new" museum is based on the knowledge and energy of the "living forces" of the population and therefore, involves the public in its various performances.

The purpose of these "new museums" is reconciled to the ecological panorama. The traditional field of study between different practices, such as art, ethnology, history, natural sciences etc., is substituted by an interdisciplinary approach that accentuates on the relations between man and his surroundings. Hence, the task of the " new" museum is theme-centered. in contrast to prevailed object-oriented, traditional museum work. The themes to be applied to emanate from the "collective memory" and from present-day needs.

The approach followed by the "new" museum also includes recording, documenting, conserving and investigating the past, i.e. the cultural and natural heritage, but also making the museum usable for the present. Andrea Hauenschild[3] compared traditional museum and ideal 'new' museum, which is stated below.

	Traditional museum	Ideal "new" museum
Objective	• Preservation and protection of a given material heritage	• Coping with everyday life • Social development
Basic principle :	• Protection of the objects	• Extensive, radical public orientation • Territoriality
Structure and organization	• Institutionalization • Government financing • Central museum building • Professional staff • Hierarchical structure	• Little institutionalization • Financing through local resources • Decentralization • Participation • Teamwork based on equal rights
Approach :	• Subject: extract from reality (objects placed in museums) • Discipline-oriented restrictivenses • Orientation to the object • Orientation to the past	• Subject: complex reality • Interdisciplinarity • Theme orientation • Linking the past to the present and future • Cooperation with local/ regional organizations
Tasks :	• Collection • Documentation • Research • Conservation • Mediation	• Collection • Documentation • Research • Conservation • Mediation • Continuing education • Evaluation

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[3] Hauenchild, Andrea, Claims and Reality of New Museology : Case Studies in Canada, the United States and Mexico, originally published by the International Council of Museums (ICOM) in German, 1988.

The Discussion of Museology

Besides the identification of a distinct position of museums in society, there gradually evolved a centra idea of theory, the study of which is known as museology. Museology is the science of runing a museum, much often practiced to the affair of the museum managing its collections rather than it administration or marketing procedure.

Initially, museology was developed as notion from subject matter disciplines. The word 'museology' is at least century old while concept of a theory of museums can be traced as far back as the sixteenth century, at least, as segment of the development of the 'modern' museum. In 1885, J. Graeser added the suffix *'ology'* to museum. He wrote, "If thirty or even twenty years ago anyone had talked or written about museology as a science, many people would have reacted with a compassionate or contemptuous smile. Today, this is, of course, different.[4]

For many reasons, the evolution of this conception was not swift. Museum staff was competent in specific practices and experts from other disciplines and techniques accomplished the practical aspects of museum work, for instance preservation and exhibition, even if they particularly discovered the requirements of the museum and its society.

New Museology

Around 1970, international museologists explained traditional museology and accepted a new approach to this science applied to the 'meaning of vestiges'. Eco (/new) museology, defined by the French ethnologist George Henri Riviere[5], was in its pinnacle. The population wa involved towards enhancing the inherited vestiges. in situ exhibits increased and new museology was born. The importance of flourishing of the science and museology to more wide-ranging anthropological and social realities, grounded in the physical environment, became immediately perceptible. The museum object gone out the temple of the *Muses*. It was no longer an object of veneration like the archetype of the past. The object played a "museological" role.

According to the Document de travail (1984) : "New museology proposes to remove barriers in different ways: to go into environments not favorable to museums, to extend the museum throughout an area, to make sporadic excursions into non-museum environments, to give shows before neglected publics, to distribute the museum throughout homes, families and other social and productive cells (hospitals, factories, people's houses)."

Museology is a holistic theory about preservation, research, communication of heritages and their inclusion into various forms of sustainable development.[6]

This form of museum work, which is distinguished by public participation, is described

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4. Graeser, J. *Zeitschrift fur Museologie and Antiquitatenkude* (1885) as cited by Evzen Schneider, "The Way of Museums : An Exhibition at the Moravian Museum, Brno" Museum 29 (1977), p. 183.
5. Riviere, Georges-Henri. *The ecomuseum—an evolutive definition.* Museum, vol. 37/1985(4). pp. 182-183.
6. This definition of Museology was first introduced on a lecture called "The development of Museum—tourist destinations : example Superegg and the Eco museum of provincial cultures Skorba", to the participants of The Elementary School of Museology, that place in Celje and Ptuj between 28th June and 2nd July 2004.

by representatives of new museology as ''people's museography''[7]. Regarding the position of the visitor, the Document de travail states (1984): "Collective memory, social subjects and creative movement completely change the concept of the museum visitor. Contemplation and intellectual pleasure are supplanted by the participation and involvement of the visitor, who in this way becomes an integral part of the new museum in place of being merely a guest".

In the recognized and developed schemes of museology there are special museology or 'other museologies', which comprise critical museology, experimental museology, comparative museology, new museology, ecomusology, economuseology, etc. Peter van Mensch (1992, 'Towards a Methodology of Museology', doctoral thesis, University of Zagreb, Faculty of Philosophy, Zagreb, pp. 62-65, 277-281) identifies the inclination to the diversion of special museology to a chain of different museologies. These are ethnographical museology, historical museology, artistic museology, literary museology, zoomuseology, anthropomuseology and ethnomuseology.

New museology[8] is an idea of the museum as an educational tool in the service of societal development (de Varine 1986): ''[...] the museum, for us, is or rather should be one of the most highly perfected tools that society has available to prepare and accompany its own transformation." At the center of this idea of a museum lie not things, but people.[9]

An association of museum workers, called the International Movement for New Museology (MINOM) was formed during the 1980s, as a result of the protest against and endeavor to modify established, stagnating, museum practice. The group comprised of museologists who have united to investigate conception of the ''new'' museum as a democratic, educational institution in the service of social development (particularly at the local and regional level). According to Baron (1987)[10] the thrust of new museology is: "[...], this new active or community museology emphatically challenges the museum as an institution, the authority and all-powerfulness of the curators, the domination of the fine arts over an other disciplines, aesthetic pleasure as the essential criterion of an object's value the absolute precedence of objects over life and the abiding nature of the history and values of an elite that turns to its profit the resources of the planet, the creativity of its inhabitants and taxes of its fellow citizens.

Therefore, new museology redefines these component elements (Nicolas, Alain. ''*Du*

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[7] Rivard, René, *Vers une muséologie nouvelle.. [Toward a New Museology]*. Lecture given at the Congres annul de,' AMC-SMQ, Quebec, 5/25, 1984, (unpublished manuscript) defines ''people's museography'' as ''......a body of techniques and practices applied by a population to the conservation and enhancement, in a museum or otherwise heritage of the community and its territory.'' ''Ecomuseums in Quebec'', Museum, CXXXVIII (1985), 202-205.

[8] The term ''new museology'' used here is a translation of the commonly used French and Spanish terms ''*nouvelle nuseologie*'' and ''*nueva museologia*''.

[9] de Varine, H. "New Museology and the Renewal of the Museum Tradition'' and ''The Role of Scandinavia in New Museology'', in MINOM (*Mouvement International pour le Nouveau Museologie*) Third International Workshop - Traditions et Perspectives Nordiques. Toten, Norway: MINOM, 1986.

[10] Baron, Guy. *Nouvelle Muséologie et ecomuséologie en milieu amerindien [New Museology and Ecomuseology in the Environment of the Americal Indian]*. Courcelles, 1987 (unpublished manuscript).

Musee institutionel au 'Nouveau Musee'' [From the institutional museum to the ''new museum], MNES Info bulletin, II, Nr.2-3/1984, pp.1-2.) :

1. The collection is the totality of the heritage
2. The building is the totality of the territory.
3. The public is the totality of the population.

Therefore, the nature/culture relationship drives us to recognize museum and museology in terms of a more ecosystem-based perception and approach, in which the bounds between academic fields is no longer as prominent as in times past. Museums continue in their own way – they re-create, shape, store and deposit cultural and natural heritage. Cultural and natural heritage cannot be accessed from a closed, 'sectarian' bias. We live in an epoch, where exist different branches of knowledge and their complexity and interaction is recognized. This is diametric to their limitation or to a linear approach. Thus, the present fast growth of museum and museology indicates to a new milieu of inherited approaches in which nature and culture interact and drive us to revise our traditional conception of museum and museology.

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MUSEUMS IN ENVIRONMENTAL EDUCATION

Indrani Bhattacharya (Chanda)

Preface

The French word *environ* means *round about* and literally *environment* is the sum total of influences that modify and determine the development of life and character. In modern sense, the term *environment,* first used, in 1835, by a French naturalist, Etienne Geoffrey Saint-Hilaire, refers to the dependence of the organisms upon the physiographical surroundings. It suggests that the environment determines the creatures that live in it.

During the last few decades, it has become a major concern to protect the environment from being destroyed as a result of incessant irrational exploitation for human existence and industrial development. A situation is created where development directly confronts the very stability of the environment. It is a kind of role reversal—instead of being protected by the environment, human beings are assigned to protect it! The growing concern was reflected in the International Conference on Human Environment, held in Stockholm, in 1972, which attracted worldwide attention to the preservation of environment for sustainable development.

To be honest, one must admit that the ancient Indian civilisation was well aware of the importance of environmental protection, amply evidenced through the epics and mythologies.

Concerns to environmental issues were also shown by the architects of the Republic of India, as envisaged through the Articles 48 (A) and 51(A) of the Indian Constitution. The Government of India has created the Department of Environment in 1980. A National Environment. Policy is being drafted presently.

But all serious efforts directing towards environmental protection and conservation of natural resources and heritage require active public participation. Since environment is a common property shared and used by everyone, environmental protection must become a people's movement. The first step in involving public participation is the creation of awareness through *environmental education.* It is the process of creating awareness where museums can playa major role.

Environmental Education

Environmental education is the process of changing public attitude about man in relation with his environment. It involves an understanding of the problems owing to the changes in the man-environment relationship of the past and the present. Environmental education has to make everyone aware of the natural heritage and his/her responsibility to preserve it and towards the world s/he lives in. The motto of environmental action is *thinking globally but acting locally.*

The objectives of UNESCO-UNEP International Environmental Education Programme are—

i) To make people aware of the nature of relationship between humanity and the environment on which he depends.

ii) To impart knowledge and skills to understand and solve environment and development related problems.

iii) To enable people to acquire the attitudes and motivations leading to sound decisions and civic actions for the protection and improvement of the environment and its quality.

Museums are in a position to study & know the present-day environmental problems faced by the human civilisation; motivate people to accept & share responsibility, and to communicate the solutions to the community, individually & collectively.

Museums have a marvellous opportunity with the resources at their disposal — display & exhibition techniques, communication strategies and educational activities — that can play a very significant role in environmental education.

Museums store objects and information. These are the centres for learning in informal ambience. Properly organised exhibitions form the basic foundation in imparting education to the visitors. Small children can build-up sound knowledge base on various aspects of natural heritage, because they can physically observe the original things in the museums beside the exposures to the interpretations of different ramifications. Museums can effectively create environmental awareness on the issues like pollution of air & water bodies, deforestation, destruction of wildlife, population explosion, overuse of insecticides, etc., through its resources. Impact of any environmental disaster can be projected very easily by museum exposition.

Work for setting up a museum solely aiming for environmental education started in the year 1972, with an integrated approach of presentation for depicting nature as a whole, rather than compartmentalising into disciplines like Botany, Zoology and Geology. It culminated into establishment of the National Museum of Natural History (NMNH) at New Delhi, which was thrown open to the public on 5th June 1978. The museum functions directly under the Union Ministry of Forests & Environment and presently got three Regional Museums of Natural History at Mysore, Bhopal and Bhubaneswar under its control.

Besides the natural history museums, mention must be made of the role being played in imparting environmental education by the chain of about 30 science museums and centres, spread allover India, under the National Council of Science Museums (NCSM), of which two are in Kolkata, *viz*, the Birla Industrial & Technological Museum (the first science museum in India, founded in 1959) and the Science City.

One must not forget the contributions of museums, like the Indian Museum, Kolkata, Government Museum, Chennai, Prince of Wales Museum (Chhatrapati Shivaji Maharaj Vastu Sangrahalaya), Mumbai, Central Museum, Nagpur, and numerous other renowned or not so renowned museums portraying topics related to environment through their displays and programmes since the time when environmental issues did not become a backburner.

Modus Operandi

Now, one may ask, how the museums do that? First it conveys the subject matter through permanent exhibition and supplement by regular educational programmes.

The most commonly used method of showing environment of a particular region through permanent exhibition is the *dioramas*. Diorama is actually three-dimensional representation of a scene, in which figure and objects, usually life-sized, are grouped in front of a painted or modelled background that creates an illusion of depth. These are extremely useful in showing a particular habitat group. Very often visual and verbal aids like labels, illustrations, and recorded narrations are provided with dioramas to enhance communication. The National Museum of Natural History, New Delhi, extensively used such techniques to show different ecosystems. Indian Museum, Kolkata, has got few such dioramas. Nowadays very large walk —through dioramas are being used in the museums. The *Evolution Park* at the Science City, Kolkata, and majority of the exhibition at the *Kolkata Panorama*, built within the Town Hall, used such dioramas. Another very useful improvement is the *double dioramas* or *mirror scope dioramas*, where light reflections through mirrors project changes on a particular region. The NMNH, New Delhi, used it. A very large such diorama is being fabricated at the upcoming Ahmedabad Science City, where the pre and post earthquake situations of Bhuj are being shown. The Life Science Gallery at the Birla Industrial & Technological Museum, Kolkata has also got dioramic representation of ecosystems.

Another very modern system is to grow live self-sustained ecosystem within the museum premises. Vivaria have also become very popular to convey environment of a particular species. The remarkable success made at the Kolkata Science City in representing the complete life cycle of butterflies in an enclosure is worth mentioning. Aquaria are also used to show aquatic environment.

Such examples are plenty, but these are almost passive experiences by the visiting masses, if not supplemented by other communication methods. That part, often referred to as *museum extension service* or *extra mural programme* or *outreach programme*, comes under the purview of the museum educators.

Museum Programmes for Environmental Education

Education is one of the integral parts of functioning of a museum. Every museum, worth mentioning, does have various programmes, aimed at different target groups, for environment education — physical, natural or cultural, whatsoever may be. Such programmes of museums are nothing but ramifications of regular educational activities Some of these are listed below:

1. **Gallery Talks**—these have very little differences with the guide lecture. Here either the *guide lecturer* or the in-charge of the collection of a particular gallery, like *Keeper* or *Curator* or any eminent scholar on the subject, delivers illustrative lectures on the environmental topic/s with the help of original objects displayed in the gallery to a gathering of general visitors. These are essentially popular in nature to communicate or popularise the nuances of the subject to common people in a simple way.
2. **Popular Lectures**—These are mainly practised in the science museums, where various topics, especially on science, like ecology, wild life and conservation, are communicated to general visitors with the help of very simple yet attractive experiments. These programmes are generally conducted in a collection space, outside the galleries, like the museum auditorium. The education staff of the museum usually deliver such lectures.
3. **Nature Appreciation/Awareness Programme**—These types of programmes are generally undertaken for enthusiastic people to prepare them to appreciate properly the wealth of the nature.
4. **Special Programme for Special Visitors**—Special visitors comprise the chunk of

population with any sort of physical or mental challenge, like the locomotor disables, the visually impaired, the hearing impaired, the mentally challenged, aged people, etc., who need some sort of adjustment in the regular programmes. Special programmes are carried out by the museums for these visitors, often with the help of different organisations working with such groups of people. *Touch, feel and learn* for the visually challenged and *Into the world of silence* for the hearing challenged visitors at the NMNH, New Delhi, are worth mentioning,

5. **Slide Show**—Small shows of slides, prepared on the collection of the museum, on display or in store, are conducted for the visitors.
6. **Film Show**—Films on various topics of environment, biodiversity, ecology, etc. are shown regularly to the visitors in the museum auditorium.
7. **Quiz Programme**—The education staff of the museum conduct such programmes for the visitors, generally young ones, to arouse interest and curiosity on the museum collection or related topics. Small incentives are also offered.
8. **Sit & Draw Programmes**—These are also organised mainly for the young visitors on special occasions.
9. **Mobile Exhibition/Museobus**—The idea of such programme is to extend the museums' educational activities to the rural areas of the Country. Generally, a set of exhibits is specially prepared for such exhibition. The concept might have originated in abroad but the technique has been perfected in India. In 1965, the BITM, Kolkata and VITM, Bangalore, had designed a special bus to carry a set of science exhibits, all working, to the remote corners of the country. This has become a role model for many countries of the world. The bus usually contains 24 exhibits housed in sturdy boxes and are placed inside 24 alcoves specially designed on the body of the bus itself, 12 outside and 12 inside. The bus is taken to the targeted areas by a team of four persons — one driver, one technician, and one helper, led by a staff of the education department of the museum. The unit also carries a small film projector, with all its accessories, film rolls, and often a portable generator set. On reaching the desired spot, the exhibition is thrown open to the visitors. The visitors can go into the bus; can see the exhibits inside and outside. The films are shown, generally, in the evening. Sometimes popular talks are also organised. This is a very effective extension programme conducted by the museums.
10. **School Loan Service/School Loan Kits**—The museums generally fabricate small boxes containing replicas of objects in the collection of museum. Science museums put small working models to demonstrate certain scientific principles. Natural History Museums put preserved specimens. The box or kit containing the object or exhibit, with all necessary information, visual aids, etc. are given to the schools on loan for a specific period, after which such kits can be returned and a new set can be borrowed. This is a very effective tool to complement the formal education.
11. **Science Demonstration Lecture (SDL)**—Museums organise demonstration lectures for specific target groups on various topics related to its collection. Science museums generally constitute a team of expert educational staff to conduct such programmes comprising few scientific experiments on the selected topics of the science curriculum of secondary and higher secondary levels. The unit is sent to the rural schools where laboratory facilities might not be up to the standard.

12. **Seminar, Conference & Workshops**—Museums organise nos. of seminars, conferences and workshops on various topics on various occasions. The annual science seminar organised by the National Council of Science Museums (NCSM) is an ideal example. Students (IX-XI standards) are selected, through competitions from District, State, Zonal levels, to the National competition. The winners are awarded NCSM scholarships for a year.
13. **Fair**—Museums organise different fairs, like science fairs, etc. Structure of the science fairs is like the science seminars.
14. **Hobby Camps/Vacation Camps**—Conducted for the school students during the vacations. The aim is to arouse curiosity, honing and nurturing creative abilities. Science museums maintain a special *Creative Ability Centre (CAC)* for the purpose. Various activities of 10/12 days are chosen on topics like, painting, modelling, print/replica making, life science, astronomy, telescope making, natural environment, etc.
15. **Pet club**—The BITM, Kolkata has a pet club for the school students, from where various pets can be taken home on loan.
16. **Drama**—Organised on special occasions, e.g., drama programme on environment day (5 June).
17. **Puppet shows**—Mainly organised for the children.
18. **Costume parade**—Where children dress themselves as plants or animals on environment day, wildlife week, etc.
19. **Special Programmes**—Many museums organise many special programmes of environment, like: Nature Trail, Nature Study Camp, Tree mapping, Bird & insect watching, etc.; Care for the Environment Contest, like, Symbol designing, Slogan contest, Poster making, Song & Poem composing, Comic strip preparation, Film Script writing, etc., on environment.
20. **Discovery Room**—Another very useful method for educating the children about the Nature and environment. Here the students are led to a special room and allowed to discover themselves various objects/ components of nature.

Conclusion

At the end importance of setting up of small museums at every school, college, portraying different aspects of environment, especially that of the local ones must be emphasised. The *Environment and Man* museum, of the Narendrapur Ramakrishna Mission Ashrama, may be cited as one of the ideal examples of such a museum, where various ecosystems have been shown through dioramas, walk-through diorama and multimedia presentation. Everyone must visit the small but beautiful museum and may get a preliminary idea. If required, the Department of Museology of the University of Calcutta can provide necessary expertise.

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TOWARDS BARRIER FREE ENVIRONMENT : ACCESS FOR ALL A GUIDE FOR THE EDUCATIONAL INSTITUTIONS

Supreo Chanda

Introduction

Today's world has been ripped apart by several divisive factors, like poverty, unequal economic growth & resource distribution, social prejudice, racial discrimination, political boundary, geographical isolations, language difference, physical challenge, etc., all of which act as barriers, in one form or other.

Illiteracy and poverty acts as a bane against the accessibility. These two act as socio-cultural and economic barriers to proper utilisation of the Country's resources. This is where the academic institutions become disabled! But these have great responsibilities as institutions of learning in proper ambience. The impediments to the accessibility, like low literacy rate, low income, less power to spend, gender discrimination, aspirations of the religious and demographic minorities, geriatric population, etc., are quite difficult to remove.

Apart from the above, a potential section of the Indian citizens comprise the persons affected by one or other form of physical disability. Nearly 7% of the Country's population are disabled, of which about 12.5% suffer from more than one type of disability. To it may be added 6.7% senior citizens, who also suffer from degrees of physical disability. The number is ever increasing and is becoming too large to be ignored. Denying proper access to the disabled is also a violation of the ***Persons with Disabilities Act, 1995***. Unfortunately very few Public institutions in India provide even a ramp for the persons with physical disability, leave aside complete access. There has been an urgent need to formulate a guideline for the institutions so that the issue of access, accessibility, attitude and sensitisation can be addressed properly. The author, being physically challenged himself, tries to make a basic guideline for the academic institutions of India, somewhat in the lines of the Disable Persons' International (DPI), so that the provisions of access to the physically disables, *viz.* loco motor disabled, blind, low-visioned, and hearing and speech disabled, can be made.

Few related terms

In recent years few words like, barrier, access, accessibility, etc., have become buzzwords and are being used in several sectors, including the computer terminologies. Let us look into the lexical meanings of these words (Chambers 21st Century Dictionary) :

- Barrier = Anything or circumstance, etc. that separates People, items, etc.
- Access = The right, opportunity or ability to use, approach, meet with or enter something.
- Accessible = Easy to understand and enjoy or get some benefit from.
- Challenged = Some kind of handicap, impairment or disability.

Types of Barriers

Broadly we may categorise Barriers into following divisions –

- Attitudinal
- Intellectual
- Ideological
- Linguistic
- Educational
- Social
- Cultural
- Economical
- Geographical
- Political
- Gender
- Physical

If we look very closely into the above divisions, we shall find that the some barriers are purely personal (e.g. attitudinal), few are social or economical or cultural, which are quite difficult to remove. Only the last one, i.e., the physical barriers can definitely be removed, if concerted efforts are made consciously. Therefore, to start with the easy task, we may try to understand physical barriers first.

Physical Barriers

Physical Barriers are those caused by some attributes on one's physic that result in performing certain chores differently. These can further be divided into –

- **Stature & Orientation :** Stature of an individual may vary depending on race, structure, growth, genetic factors, hormone, etc. As a result, one may become too short, another may become too tall, both of which act as barriers (*vertically challenged*). A person may be too stout or too thin causing impediments. There are many people who are left-handed. As most of the conveniences are created keeping in mind the majority right-handed persons the otherwise oriented persons are quite inconvenienced.
- **Locomotor :** The persons having difficulties in using limbs due to impairments of bones, joints and muscles causing impediments in movements.
- **Visual :** Persons having loss of vision or difficulties in seeing.
- **Hearing & Speech :** Persons, who cannot hear properly and, as a result, often cannot speak.
- **Mental :** Persons having difficulties in their mental faculties due to chromosomal, congenital, psychological or psychiatric problems.

To it may be added :

- Aged people with multiple difficulties – less agile, restricted mobility, poor vision, presbyopia, hearing loss, fatigue & frailty, etc.
- Persons with slight or remnant vision – who have difficulties in seeing in dim light, wear high-powered glasses, or having very near vision.
- Persons, who have problems in perception of certain colours (colour blindness).
- Persons with stammering problem.

Legal Definitions

According to the *Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995* [Chapter I, Section 2(i)], Disability means :

- Blindness
- Low vision

- Leprosy-cured
- Hearing impairment
- Locomotor disability
- Mental retardation
- Mental illness

Person with Disability means a person suffering from not less than 40% of any disability as certified by a medical authority [Section 2(t)].

At present there are approximately 70 million disabled people in India.

Accessibility

The problem of accessibility involves –

- The Built Environment
- Transportation
- Communication
- Information

Here one should always keep in mind that –

1. Access is about creating an environment that *everybody* feels comfortable using.
2. Access is important to *all people* and *everybody* will benefit from a well-designed accessible environment.
3. Access is a ***right***, not a privilege.

> **"EVERYONE HAS THE RIGHT FREELY TO ENJOY THE ARTISTIC AND CULTURAL LIFE OF THE COMMUNITY."—Article 27.1 of the Universal Declaration of Human Rights.**

I deliberately quoted the above Article to show that, if equal right has been given to the less important (!) subjects like art & culture, the fields enjoying more priorities in our lives must have been given equalities in terms of individual right. Therefore we cannot simply shut the doors on the face of any individual just for his/her inability (?) to get into it. We should also note that the term disable is being interpreted by some as *differently able* also, and in true sense they are indeed correct. So none can be socially excluded on any pretext. This idea is the fundamental basis for creating barrier free environment.

Let us now examine the legal provision for the disables in India. There is a very potent act called the *Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995*, came into effect from the 1st January 1996. I quote relevant Chapters, Sections and Subsections having important provisions for the disables in relation to the academic institutions.

Chapter V (Education)

- **Section 30 (b)** asks for the *removal of architectural barriers from schools, colleges or other institutions imparting vocational and professional training.*

Chapter VI (Employment)

- **Section 32** provides for reservation of at least 3% jobs in every Govt. establishment for the persons with disabilities, of which 1% each shall be reserved for persons suffering from—

1. Blindness or low vision,
2. Hearing impairment,
3. Locomotor disability or cerebral palsy.

- **Section 39** says ***All Govt. Educational institutions*** *and other educational institutions receiving aid from the Govt.* ***shall reserve not less than 3% seats*** *for persons with disabilities.*

Chapter VIII (Non-Discrimination)

- **Section 46** provides for –
  - i) Ramps in public buildings,
  - ii) Adaptation of toilets for wheel chair users,
  - iii) Braille symbols and auditory signals in elevators or lifts,
  - iv) Ramps in hospitals, primary health centres and other medical care and rehabilitation institutions.

Many such provisions are there to protect the rights of the disables. The Act has delegated enough powers to The Chief Commissioner for Persons with Disabilities (in Delhi) and The Commissioners for Persons with Disabilities (one in each State). The following paragraphs illustrate the powers conferred upon them —

Chapter XII (The Chief Commissioner and Commissioners for Persons with Disabilities)

i) **Sections 59 & 62** say that the Chief Commissioner/ Commissioner (respectively) *may of his own motion or on the application of any aggrieved person or otherwise look into complaints with respect to matters relating to —*

1. *deprivation of rights of persons with disabilities;*
2. *non-implementation of laws, rules, bye-laws, regulations, executive orders, guidelines or instructions made or issued by the appropriate Governments and the local authorities for the welfare and protection of rights or persons with disabilities, and take up the matter with the appropriate authorities.*

ii) **Section 63**

1. *The Chief Commissioner and the Commissioners shall, for the purpose of discharging their functions under this Act, have the same powers as are vested in a court under the Code of Civil Procedure, 1908 while trying a suit, in respect of the following matters, namely:–*
   - *a. summoning and enforcing the attendance of witnesses;*
   - *b. requiring the discovery and production of any document;*
   - *c. requisitioning any public record or copy thereof from any court or office;*
   - *d. receiving evidence on affidavits; and*
   - *e. issuing commissions for the examination of witnesses or documents*

3. *Every proceeding before the Chief Commissioner and Commissioners shall be a judicial proceeding within the meaning of sections 193 and 228 of the Indian Penal Code and the Chief Commissioner, the Commissioners, the competent authority, shall be deemed to be a civil court for the purposes of section 195 and Chapter XXVI of the Code of Criminal Procedure, 1973.*

The preceding paragraphs perhaps amply justified that access is indeed a right—both legal right & human right—not a privilege.

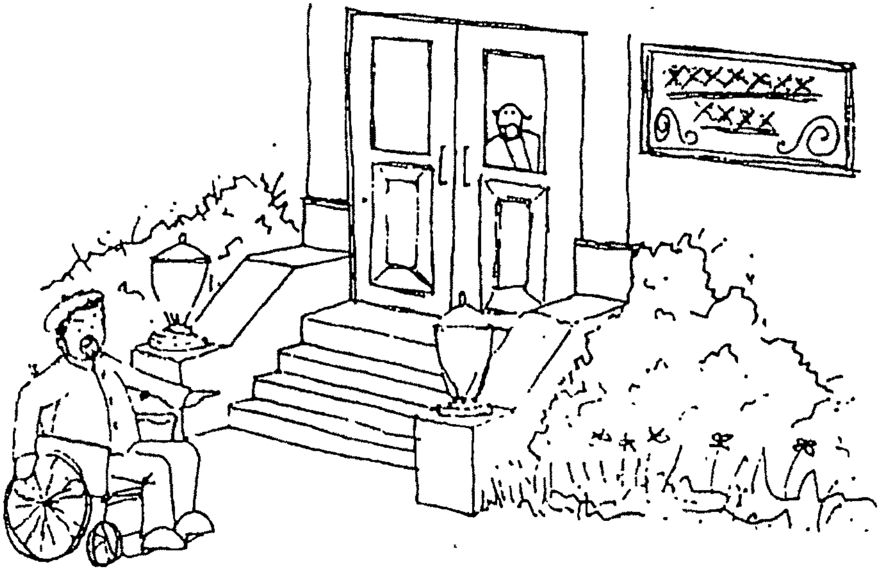
Before making environment barrier free, we must examine the social attitudes towards the disables and take up the task of sensitising ourselves.

Attitude & Sensitisation

Social Attitude & Apathy

- Sight of physical deformity disturbing.
- Physical disability is an omen.
- Curiosity/ Sympathy—often cause :
    - * Disgust/ problem,
    - * Social exclusion.

Disability is Social Restriction rather than Individual Impairment



I cannot get into your institution because of these steps, not because of my impairments!

Staff Training

- All staff should undergo disability equality training.
- Staff must clearly understand disability, impairment & handicap.
- Staff must know how to communicate clearly.
- Everyone must know to use equipment used by the disables.
- Staff must be trained to control the expression of sympathy and should know to offer assistance only when called for.
- All the staff members must be made aware of using politically correct words.

- One of the staff members may be assigned to act as access officer, who may liaise between the institution & the NGOs concerned with the disables.

We may now discuss the ways to provide physical access. I have deliberately avoided the technical data, which can be procured from the guidebooks referred at the end of this article. Access to transport has not been discussed here because providing transport facilities are out of the purview of the academic institutions.

Steps to be taken to provide proper access

Built Environment

- **Entrance & Paths leading to the Main Gate**
  a) Common Entrance for all to avoid discrimination.
  b) Paths leading to the main door, corridors, passages, alleys, etc., should be provided with guiding blocks.
  c) Outdoor paths preferably be covered. At least temporary shelters should be provided at every 25 m.
  d) Pavements, if present, should have drop kerbs.
  e) Gravels or sand should not be put on the path.
  f) 5% Parking space, if present, should be reserved for the disables (<50 m).
  g) Ramps with handrails must be there beside steps at the entrance.
  h) Steps should have handrails on both sides.
  i) Step edges should be rounded off.
  j) Step edges should be highlighted with non-slip, non-reflective materials, preferably in white or yellow contrast.
  k) Doors should be wide enough to allow wheelchair and easy to open.
  l) Mats at the entrance, if any, should be embedded in the ground and not projecting out.
  m) Proper signage and a detailed guide map should be there in the foyer, preferably in relief.
  n) Entrance and steps must be well illuminated, preferably > 150 lux.
- **Office Area**
  a) Easy to find, spacious, well lit (500 lux).
  b) The floor should be non slippery.
  c) At least one low-height counter should be there (750-800 mm).
  d) All glasses must be non-reflective.
  e) Notice Boards should be hung low (1.2-1.4 m), sufficiently lit from above (>150 lux).
  f) Written information should be clearly displayed in large print (≥ 18 pt.) in simple font (e.g. Arial).
  g) Few seats, fixed to the floor, should be kept there.

- **Classrooms & Interiors**
  - a) Floors, walls & furniture should be colour contrasted.
  - b) Doors should be easy to open and wide enough to allow wheelchairs. Sliding doors are better.
  - c) Adequate lights should be provided, preferably not below 200 lux.
  - d) Furniture should be ergonomically designed.
  - e) Separate space should be kept at the front row for wheelchairs.
  - f) Platforms should have easy slope.
  - g) Blackboards should be non-reflective, lit from above and large enough to allow wheelchair users to reach.
  - h) Furniture smaller than knee heights should be avoided.
  - i) Protruding fixtures, like doorknobs, should be highlighted.
  - j) Corridors should be kept clear of equipment like fire extinguishers, telephones that project more than 10 cm.
- **Auditorium**
  - a) Carpets should be avoided.
  - b) First and last row should have space for wheelchair to dock.
  - c) There should be handrails on both the sides.
  - d) Ramp (with handrails) on one side to reach the stage.
  - e) Seat numbers should be embossed
- **Toilet**
  - a) All toilets should be made accessible. If not possible, at least one separate toilet on each floor, wide enough with sliding doors.
  - b) Adequate space for transferring.
  - c) Vertical and horizontal grab bars on 3 sides.
  - d) Urinal platforms should be removed.
  - e) Washbasins, fittings, etc., at appropriate level.
  - f) Faucets with lever action.
- **Canteen**
  - a) Chairs & tables should be laid keeping enough space in between the clusters (1.2m).
  - b) Floor, furniture, utensils, crockery, cutleries should be colour contrasted.
  - c) Dimensions of table, counter, sink, washbasin, etc. should be suitable for wheelchair users.
- **Public Telephone**
  - a) Low enough for wheelchair users (handset between 1 & 1.4 m).
  - b) Should have speech amplifier.
  - c) Should have raised numbers.
  - d) Sitting provision for those who need to seat while talking on phone.

- **Lift**
  - a) Slow moving.
  - b) Should be wide enough to allow wheelchair and have a large mirror facing the door. Walls facing the lift, on each floor, should have mirrors as well.
  - c) Handrails should be there at appropriate level on 3 walls of the lift.
  - d) Switches should be low, illuminated and have raised numbers.
  - e) Should have audio-guides.
- **Security System**
  - a) Illuminated, internationally accepted pictogramic signages & symbols should be prominently displayed with simple, clear written information just below. Tactile signs better.
  - b) Fire fighting equipment be made reachable.
  - c) Fire/smoke alarms should have flashing lights.
  - d) Emergency doors must be well illuminated and exit routes should be clearly marked.
  - e) Staff must be properly trained to assist disables for prompt & effective evacuation in emergency.

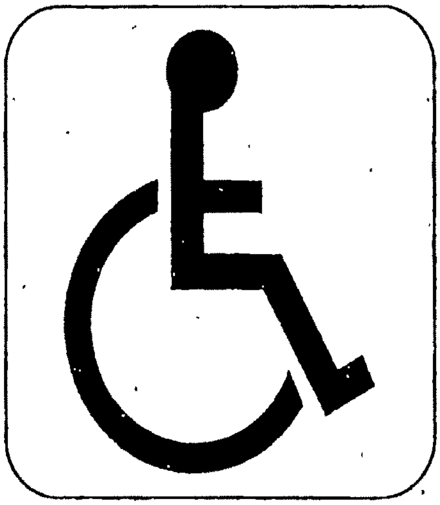
Information and Communication

- **Printed Matters**
  - a) Non-reflecting material should be used to print on.
  - b) Contrast between print and background.
  - c) Large print of 14 pt (18 pt is more useful).
  - d) Simple fonts, like Arial, should be used.
  - e) Should be in straight language, clear, brief and to the point.
  - f) Long texts to be broken up in short sentences and paragraphs with bold headings
  - g) Braille format should be available.
  - h) Better to provide, if possible, audiocassettes, computer diskette or CD format.
- **Face to Face Communication**
  - a) The communicator must always face the audience and should speak clearly without covering his/her mouth to enable the audience to follow the lip movement.
  - b) Conversation should be slow, clear, loud enough and devoid of accent.
- **Written Communication**
  - a) Large letters should be written without covering the blackboard with body parts
  - b) Cursive writings should be avoided.
  - c) Visual information should be accompanied with subtitle or text or picture/pictogram.
  - d) Audio description preferably be provided to the visually challenged audience.

Signage

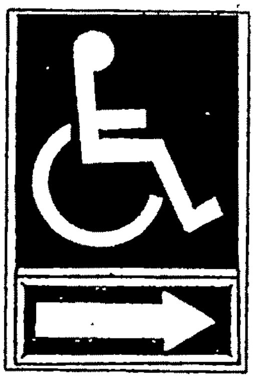
- **International Symbol of Access**

  a) Universally used to denote available facilities for all categories of challenged people.
  b) Usually done in white against blue background.
  c) The face of the figure should always direct towards right.



  d) Should be properly displayed outside the building.
  e) Must also be placed on or near all facilities.
  f) Should be illuminated and placed at eye level (1.4 – 1.6 m).

- **Directional & Service Signs**



  a) Directional signs show the ways towards the facilities for the challenged people, like ramps, elevators, etc.

b) Service signs mark the facilities earmarked for the challenged people like the telephones, toilets, etc.

c) Should be well illuminated and placed at eye-level near or on all such facilities.

Access Audit

- It is a very important component of access.
- Every institution should have a proper and clearly defined access charter.
- Access provisions should be proactively publicised.
- Disabled persons, of different categories, and groups should be consulted and involed in each & every development.
- Regular feeback must be obtained, recorded and acted upon.
- NGOs concerned with disables may be entrusted with the task of monitoring access.

Grievance Redressal

If a disable person feels aggrieved by the absence of accessibility provisions, non-implementation of any clause of the Persons with Disability Act, or face any discrimination at the place of work/ institution, he/she may approach the following authorities for Redressal –

1. The Chief Commissioner for Persons with Disabilities
   Sarojini House
   6 Bhagwan Das Road
   New Delhi 110 001.
2. The Commissioner for Persons with Disabilities
   45 Ganesh Chandra Avenue (2nd Floor)
   Kolkata 700 013.

Conclusion

In the previous few pages, different types of barriers, physical disabilities, legal provisions to protect disables, means to provide access and different aspects of accessibilities have been discussed. Providing proper access to disables is a legal obligation for all public institutions. Moreover as responsible social institutions, academic institutions cannot discriminate against and exclude anyone from gaining benefits at their dispensation. Making environment – physical, social or cultural – barrier free is a must for all such institutions. We all must take a vow to end all kinds of discriminations and may dream of creating a world for all to live together peacefully.

Reference

1. Office of the Chief Commissioner for Persons with Disabilities, Government of India – *Planning a Barrier Free Environment.*
2. DPI-EUC – *Millennium Access Guide, 1998.*
3. The Gazette of India, Extraordinary, Part II — Section I, January 1, 1996 – *The Persons With Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995.*

PRESERVATION OF ANCIENT MONUMENTS— NEED FOR A CONSERTED EFFORTS

Prof. (Dr.) Samir Kumar Mukherjee

India is one of the richest countries in the world in the domain of archaeological monuments and remains. The pioneering venture from the mid 18th century under the initiative of the colonial rulers and scholars like Alexander Cunningham, Markham Kittoe, Edward Thomas in North India and Walter Elliot in South India, Dr. J. Stevenson and Dr. Bhau Daji, an Indian scholar in western India ancient monuments received much attention and importances Establishment of the Archaeological Survey of India in 1861 under Alexander Cunningham paved the way towards preservation of ancient monuments.

Prior to the arrival of Cunningham on the scene, there existed apathy, indifference and callousness towards ancient monuments and sites. Several factors like climatic and human agency and natural causes are responsible for deterioration and gradual decaying of ancient monuments and sites. Existence of varied climatic conditions in different parts of India are primarily responsible for deterioration and gradual damage of monuments. The eastern half of India and parts of southern India are affected by regular periodic rainfall. As a result, of the tropical rainfall thick vegetable growth is seen to develop on monuments, producing moss or lichen on their bodies that dislodge and disfigure monuments. Growth of jungle becomes a regular feature here.

Monuments located on sea shore are affected by salt action as the salt leaden air penetrates into their surfaces and wears them out. The case is somewhat different in the interior of India, where salt petre of the soil in the absence of enough plant life wears out brick structures and reduces them gradually to dust. Of all the natural causes, occasional occurance of earthquakes are immediate cause of destruction and damage to many mouuments. We have some examples from recorded history. The Kangra earthquake of 1905 brought down the Nagarkot monuments in Kangra, Himachal Pradesh. The Assam earthquake of 1918, 1945 and 1950 seriously damaged a number of monuments in sibsagar district of Assam. The Bihar earthquake of 1934 caused damage to a few monuments of Bihar.

Another destructive factor to monuments in human agency. Religious rivalry between communities often causes damage and destruction of monuments. The vandalism of some invaders from the North West caused rampant destruction of monuments that are recorded in history. In our recent memory we can cite the case of Babri mosque at Ayodhya (U.P.). Quarrying for bricks and stone for house building purposes was another principal cause for destruction of monuments. We have examples how the stupas of Bharhut in Satna (M.P.), Sarnath (U.P.) and ruins of Harappa were rampantly misused and rifled for building purposes and used for ballast for laying rail. Medieval and later Mughal forts and mahals were utilized during the wars of the 18th and the 19th centuries and also at the time of the two world wars by the Britishers for housing troups. As a result, some alterations and even demolitions of monuments were undertaken. Following the colonial tradition some parts are even partially occupied by military personnels at Delhi, Agra and Gwalior. Examples are available how ancient temples, mosque complexes were altered in public interest for accomodating schools, inspection bunglows, rest houses, etc. We know from history how some responsible high officials and high dignitories did not mind for committing acts of vandalism for collecting preious antiquities and works of Art. Under Lord Moria steps were taken to dismantle the famous marble bath in Shah Jahan's palace for a gift to King George IV. This valuable treasure has later sold by public auction under Lord Bentinck's orders. It was during the latter's time, a move was made in 1828 to demolish the Taj Mahal for the value of its marbles and precious stones and also to lease the gardens of Sikandra to the Executive Engineer at Agra for proposed cultivation. Col. Collin Mackenzie will remain immortal for his survey of monuments in the south in early 19th century did not find anything wrong in rifling the stupa at Amaravati for its beautiful sculptural components or shipping them away to England.

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The first attempt torward formulating a proposal towards preservation of monuments of historical and architectural interest began with Lord Lytton who took initiative to prevent dispoiling of the archaelogical remains by introducing the Treasure Trove Act of 1878. This Act for the first time authorised the Government to claim possession of any treasure unearthed that exceeded then rupees in value. Lord Lytton stepped further and recommended the appointment of a Curator of Ancient Monuments to look after the conservation affairs. As an outcome of this recommendation, Major H.H. Cole was appointed to this post in 1881 and his task was "to give the Government of India and the Local Governments the advantage of professional advice concerning the restoration and conservation of the ancient monuments throughout India". The expiry of the term of appointment of Cole in 1883 temporarily put an end of the conservation programme of the ASI.

The arrival of Sir John Marshall as Director General of the Archaeological Survey of India in 1902 opened a new chapter in conservation of monuments by the ASI. Marshall paid much attention to this problem and formulated a manual of conservation for the benefit of archaeological officers of the survey in 1907 and revised it in 1923 on the line of military works Handbook. This pioneering work by Marshall is treated as a Bible for undertaking conservation of ancient monuments. In 1989, British Conservation expert, Sir Bernerd Fielden compiled "Guide Lines for conservation", following the conservation manual for John Marshall. It was Marshall who under the guidence of Lord Curzon introduced the first historic legislation towards the preservation of monuments like the Ancient Monuments preservation Act of 1904 that set a new lease of life towards protecting monuments from disposal and disrepair under private custody.

The principal guidelines of conservation emphasised by Marshall are still followed by the ASI. The aim and objectives may be briefly summarised (1) preservation without disfigurement or alteration of monuments's character, (2) Maintenance in a proper and attractive condition, (3) Thorough examination of its remains and documentary evidence concerning it, (4) Preparation of literatures like monographs, picture post cards, guide books and reports, so that its historical and artistric interest may be brought home to the scholars and visitors. This may enkindle interest in the past relics of the country.

We should remember that althrough the ASI and the State Directorates of Archaeology of various States are the custodians of monuments and sites, it is also the duty and responsibility of all right thinking citizens to come forward towards protecting monuments as these constitute the cultural heritage of the natuon. Mere fixing the notification board in front of the monument or setting up of fencing around the monument are not sufficient enough to protect the monument. Mass awareness programme among the rural population is the urgent need of the hours. In this connection, efforts should start from the grass-root level. The panchayets should come forward to arouse interest in rural public about the importance and significance of monuments and sites by way of observing "Heritage Protection Week" or "Protection of Historical Properties" week. The government should pay more attention towards safeguard of monuments by way of removing illegal encrochment in ancient monuments and sites. The skyline of monuments is affected due to raising of signboards, hording posters electric and transmission towers and other forms of commercial advertisements. It is a matter of great satisfaction that some positive steps in eradicating the problem of illegal encrochment in monuments within the specified area have been undertaken at some ancient monuments and sites. Recently a good number of commercial shops at the very entrance of the Sun Temple at Konark, an important world Heritage site has been removed while implementing the beautification programme. Tending garden around the monument or infront of the monument was introduced by Sir John Marshall at the beginning of the 20th century and for this purpose the Gardening Branch was attached to each circle of the Survey. This old tradition is still a practice with A.S.I that maintains a seperate Branch for the same. The State Directorates should also do this with the help of the Forest Directorates. So that ancient monuments, sites and remains become more attractive to Visitors.

EVOLUTION OF WATER CRAFT– TRADITIONAL VOYAGE

Prof. (Dr.) Atul Chandra Bhowmick

Boat (*nouka*) is the most popular means of water transport. Boats are used for ferring passengers across narrow rivers for house-hold and agricultural purposes or for fishing by individuals.

Evolution of water craft has a long history. The use of water craft can be traced back from the end of the neolithic times and its evidence in India is from the Indus valley civilization. The lake dwellings were built towards the end of the neolithic times in the lower slope of the Alps and continued from the bronze age to the iron age. The first sign of a lake village in Switzerland was discovered in the water of lake Zuricho Similar evidences were found in Irgen-hausen and Neuchatel lakes in Switzerland and these were manifestly the one of the forms of human dwellings. They consist of wooden huts built on wooden platforms and piles, planted in peaty bottom of the lakes. Besides Switzerland such lake dwelling were found also in the Lucerne, Hungary, Italy, Julian Alps, Loubliana-Leibach and Ireland. The crannogs of Ireland were similar lake dwellings. They were all later in date than neolithic times. The best known, perhaps, were those of Glastonbury, which date from the iron age. The lake dwellings were quite close to the shore, but in later times they were often built over the water at a considerable distance from the land. The lake village must had necessitated continually the use of raft or some form of a primitive water vessel to cross the water for going from the land to the lake houses. The simplest type of such water vessel would, of course, be a scooped-out log of wood with untrimmed ends; such a specimen has been preserved at lake Bienne. Lake dwellings were Lake dwellings were developed with an eye to safe both from attacks of hostile humans as well as from ferocious wild animals.

The earliest knowledge of ships comes from Egyptian rock drawings dating from 6000 B.C. These depict crescent-shaped reed craft that had no keels. At first they were rowed, but later square sails were added that would move them when the wind blows. Certain makings on the hull of the vessel suggest that it was made of reeds bound together, a method of building, which was used for quite large boats in ancient egypt. Egyptian shipping was known in the eastern mediterranean and this foreign sailing ships and galleys visited the north-western coasts of India. Indians and babylonians might have done so,as they were supposed to have been good sailors, at any rate, in later times. The greater part of the coastal trade today is, however, in the hands of Arabs and it may be that they were already the chief navigators of the Indian ocean in early times.

Emperor Asoka sent mission to Sri Lanka headed by Prince Mâhendra son Sangamitra, daughter of Asoka for spiritual conquest. The crossed the Bay of Bengal by sea vessel, which indicates india had a high technology of ship-building as early as 2nd century B. C. The southern mission met devanampriya tissa, the ruler of the island kingdom. He was converted into Buddhist and his example was followed by his subjects. Ceylonese tradition avers that missionaries were sent even to suvarnabhumi i.e. Lower Burma, Sumatra and possibly some adjoining lands. They also used sea vessels for the purpose of going. Chand Sadagar of the *Manasamangal*, Dhanapati Sadagar, Srimanta Sadagar, son of Dhanapati Sadagar of the *Chandimangal* poem, written by Kabikankan Mukundaram Chakraborti in 16th A.D. and Puspa Datta want to Sri Lanka for trade with seven vessels (*sapta dinga madukar*). The *Manasamangal* of 15th century A.D., *Chandimongal* and *Roymongal* poem of Krishnaram Das (1686) mentioned water transport and these are the medieval Bengali literary references of river navigation.

Boat building was a regular craft of the people of Mohenjo-daro of about 2500 B.C., whose one of the chief interest was trading by boat in navigable river. The sea route to Sumer was extensively used and the coast of Baluchistan is generally inhospitable. Mohenjo-daro representation of a ship carved on a stone (length 4.3 cm.), which is mastless with a cabin and a man at oar. In the centre there is a hutlike representation, the prototype of a modern, which was also probably made either of wood or of reed. A steersman could sit at a rudder or steering oar on a raised platform over the bow. This is also used, probably for riverine traffic. From the terracotta models of boat from Lothal three major types had sails and the other was without sails. Another sherd has come to light at Mohenjo-daro showing the representation of a boat, which was roughly scratched on the pottery sherd and it is high at both ends. It has a steersman and a mast, apparently with two ends, in the centre, instead of a deck cabin. In Mohenjo-daro representation of a ship on terracotta amulet (length 4.5 cm.) shows central cabin, two big birds and two oars, now preserved in the University Museum, Pennsylvania, United States of America. The first type was a river vessel, used exclusively for river traffic and the second for both river and sea. Present day trading is done by vessels sailing from western parts of India to the Persian Gulf and even direct to Aden might well have been performed in ancient times with smaller primitive in appearance than some of those that make the voyage now. From the roughly sketched boat on a potsherd from Mohenjo-daro the following technical characteristics may be discerned. It has a sharply upturned pow and stern (*picha*) and is apparently controlled by a single oar.

The mast may possibly by a tripod and one or two yards are show or conceivably, one only; the second line representing a furled sail. This type was probably river boats from which goods were loaded on a shelving bank. S.R. Rao claims that Lothal was a boat building centre. In a complete terracotta model of a boat, according to Rao, a sharp keel, pointed prow and a high flat stern are observed along with three blind holes, one near the stern, the other near the prow and the rest near the edge of the boat for fixing the mast, for fastening the ropes of the sails and for supporting the oar respectively. In other models pointed keels, raised sterns and prows are noticeable, while in the third type flat base and pointed prow are prominent with the absence of provision for mast.

S.R. Rao is of opinion that the first two types of sharp-keeled boats with provision for the mast must have sailed on high seas, whereas the third type resembling canoes was used in the estuary only. On two potsherd found at Lothal painted depiction of multioared boats have been found, which were most probably used in ancient Sind.

More direct evidences for the anchorage of vessels have also come from Lothal. These are actual stone anchors, circular or triangular in shape with rectangular section and one perforated right across for passing the rope. Blind holes are also bored on them for anchor fixing. The identification of these circular and triangular perforated stones as anchors, as is proposed by Rao, is not free from doubt. More scientific and serious investigation may determine their true nature.

The water transport technology of the Harappan period may well regarded as prehistoric, but in that period it was no less advanced than that of the contemporary Egyptian or Mesopotamian civilizaiton. S.R. Rao and Bridget and Raymond Allchin are of the opinion that the present day country boats and the Arab *dhows* have probably some similarities with the Harappan boats.

One gold coin of Huvishka, 1st century A.D. of Kushan period was discovered from Dewan Ati, near Haroya rail station at Chandraketugarh, North 24 Parganas, West Bengal shows a ship on its reverse side. The coin may be evaluated in the perspective of ancient maritime contacts between the lower Ganges valley and the Gr (a) eco-Roman world.

The representations of ships and boats in the Ajanta paintings of 4th century A.D. are rightly interpreted by griffiths as only a vivid testimony to the ancient foreign trade of India. Of the two representations, the first shows a sea-going vessel with high stem and stern, with three oblong sails attached to as many upright masts. Each mast is surmounted by a truck and there is carried a lug-sail. There are several representations of ships and boats in ancient Indian art. A 12th century A.D. stone relief on the wall of the Jagannatha temple at Puri, Orissa shows a ceremonial barge carved in black granite and two other stone carvings of boat from Orissa, one now preserved in the Victoria and Albert Museum, London and another one in the Indian Museum, Kolkata. Boats are depicted in temple sculptures and on palm-leaf inscriptions of medieval times. A seal of New Shoreham, Sussex, England of C.1295 A.D. depicts a hulc planking vessel made in reverse-clinker technique and is now preserved in the National Maritime Museum, Greenwhich, London. A late 12th century font in Zedelgem, Belgium shows a scene from the life of St. Nicholas. The ship has hulc planking. A 19th century boat model in the Science Museum, London, once on loan to the Birla Industiral and Technological Museum, Kolkata, which resembles the Khulna boats. This model is labelled ***Khelna*** and sent to the Victoria and Albert Museum, London states that the reverse-clinker planking of full-size boats was fastened with bamboo pegs. A 15th century seal of the Admiralty Court of Bristol, England depicts a ship with reverse-clinker planking. The Asutosh Museum of Indian Art, University of Calcutta has as many as nine temple terracotta plaques in its collection showing one *bajra* (pleasure-boat) with five oars of C.5th Century from Jajpur, Orissa, one carved boat with European sailers of C.17th Century, one ship and one boat of 17th-18th Century, three peacock-shaped boats (*mayurpankhi), one* crocodile- shaped boat (*makarmukhi)* with air holes for trading tusked elephant from India probably to Europe one stone boat.

The places where water and flood abounded could be reached more quickly by water crafts. In Europe the Danubian culture of prehistoric times sprang up along the banks of the Danube river and became the centre of cultural exchange through millenniums. Africa is even today lined with a net-work of trails from the Mediterranean to the interior. The merchants have moved from the lake Chand to the north coast and from the Nile to Nigeria passing through Sudan for trade. The great rivers of the world are important determinants in the migration of men and transportation of their goods. Empiror Tang-ti was famous for the construction of the glorious Empiror canel.

The Indus, the Ganges and the Brahmaputra—the great rivers of India afforded the early centres of culture. Nowhere else in India is the Ganges such a fleet of cargo carriers ranging from the humble little craft to the picturesque white-winged argosie that carries cargoes of bulk up and down the broad basom of the main stream. On its lover reaches- two endless processions of craft of all sizes pass continuously, one going up and the other down. The connection of the water roads by canals is one of the primitive irrigational achievements of early mem.

When waterways connect countries, they are often apt to hinder travellers who must cross them to reach their destination. To overcome this men devised bridge. Primitive men have made many devices for crossing over rivers and abysses. These devices vary from the simplest to complicated one. The simplest wooden bridge is only a trunk of a tree across a small brook, but when rivers are big timber structures are erected with complicated manner balancing over forks and poles. Thus men travel over water through bridge to carry conveniently their goods to destination. Wheel barrow in China fitted with a sail is among the oldest vehicles. Steamers and ships plying comfortably on water have wheels. When bridges did not stretched over the rivers and obysses, human ingenuity did not stop at the water-ways, they float on water in a boat. Before the use of any such appliances man used to cross pools and streams by swimming. Buoyancy of wood gave an idea to make water craft. The simple light trunk of a tree floating down a water-way furnished us the earliest and oldest means of travelling on water. The raft came into existence. Two or three pieces of wooden logs are tied together tightly to form a wooden raft, which is used by man in a simple way in earlier times. Even today the Nuliyas of Puri, Orissa use catamaran, which is made of three pieces of long, narrow and thick light wooden logs tied together by fibre string and the raft looks almost like a boat. The built-boat is a typical one. Raft made of plantain (*Musa paradisiaca Linn*) stem or *Sola* (hat-plant) (*Aeschynomena aspera* Linn.), known as Indian cork plant grown wild in marshy waterlogged *bils* (swamps) and *jheels* (morasses) or *kachuri pana (Eichhornia crassipes Solms)*., a common floating herb or bundles of bamboo (*Bambusa arundinwacea* Wild) or barrels or inflated skin, or rubber or inverted earthenware pots lanced together in a bamboo framework is commonly met with and this is ususally used in the boggy lands and shallow pools in the rivering Bengal, commonly known as *bhela/bhewra*. The former (*kalar bhela*) is probably the most primitive form of raft. As used in Bengal, an identical form is also found in Tanjore, Tamilnadu, when plaintain stems are valueless soon as soon as the fruiting stage is passed, it consists of four or five of these stems roughly cut through at the ends and fastened raftwise by skewers of bamboo, sharpened at one end to enable them to be pushed through the series from side to side. Usually three of these bamboo rods are used, one towards each end and the other about mid-length. A rope of twisted straw is passed over the projected ends of each skewer and across the raft above and below, when greater rigidity is required. The size of such rafts is roughly 4 to 5 feet in length by a width of 18 to 20 inches. Plantain stems are full of tiny cubical air spaces and these give a considerable floating value to the structure. It is most useful in marshland in crossing watercourses. *Sola* raft (*solar bhela*) is used for fishing with cast-net in tanks. The *solar bhela* is usually made of three large bundles of *sola*. Each bundle is usually four feet or rather more in length and of a diameter that gives the raft a width about equal to the length.

The bundles tied round at each end, are bound together to keep them in position; two or three split bamboo sticks are laid over them and lashed thereto with country cord and an equal number beneath. The fisherman propels the raft by means of a short paddle (*hath bolar*). Rafts are also in uses in Lower Mesopotamia, where giant reeds fill the marshes and are the sole material available. Flat floating structure of a number of rough three trunks fastened together to be floated down a river makes a raft. The raft is made of bundles of *sola* sticks tied together by rope for forming craze platform and usually used in marshy places in Lower Bengal. Such a raft is very light in weight and can be carried by one man. It is propelled by a paddle or even by both hands instead of a paddle. Rafts of *sola*, plantian tree or *kachuri pana* are used in pools and gentle flowing rivers, while bamboo raft is used in current water. Raft of inflated skins is much in use on the Ganges at Hardwar, Uttaranchal and on the tributary streams where the rocky gorges of the hills, their passage is marked by rapids and obstructed by rocks and snags. At Hardwar, the skins used are those of the buffalo, turned inside out, the openings being securely tied up before turning. These are lashed together to form a raft, locally known as *sarnai.* A very common form consists of a *charpoy* (native bedstead) tied across two inflated skins. Two men, each supported on a single inflated skin, act as steersmen by swimming along by the side and guiding the raft as it floats down the river with the current, requiring great skill and knowledge of the lie of submerged rocks. The buoyancy of this raft is great and the toughness of the sking sufficient to stand much knocking about the rocks. The damage skin is repaired and reinflated thus restoring full buoyancy. When the voyage down stream is finished the raftsmen take the raft out of the water and deflating the skins, carry them back in bundles on their heads. Similarly constructed rafts of very large dimensions have been in use on the rivers of Iraq and representation of such rafts is found in the Assyrian sculptures. There can be little doubt that this method of moving men and goods down rapid streams impeded to India from Babylon and Assyria. Inflated skin raft is in use in Mesopotamia. The gourd raft is used on the river Jamuna near Dehra Dun, Uttaranchal. The gourd raft consists of two rectangular bamboo frames and the frames are tied parallel to each other and covered with a meshed net. Dried up hollow gourds are placed inside the net. Like the *sola* raft it is also light and easy to carry. In the river Budiganga fire-baked single big earthen basin, known as *tagari/gamla* is used in Dhaka and it is propelled along the water ways by men, women and children by both hands for crossing streams. It is cheap, easily obtainable and quite serviceable. The usual forms is a basin-shaped hemispherical vessel made of burnt earthenware, about two feet and a half in transverse diameter and unflattened bottom. It is big enough for one person, who squats on a short plank seat for a mass of grass or straw in the bottom. The village potter makes these quaint crafts. Earthen pot (*chatty/ghara*) raft is primitive and more ingenious and is used during the rainy season in the Patna, Gaya and Hazaribagh districts and this float is called *gharnao/ gharnai*, constructed usually of nine inverted pots, arranged in rows of three connecting bamboos lashed on either side of the mouths of these pots support a light platform of bamboo, the mouth of each *ghara* being closed with a cover of *sal (Shorea robusta* Gaertn.) leaves. During the rainy season when the country is inundated over vast areas, these *gharnaos* are invaluable to the villagers, who travel about on them, punting their way along. The raft is propelled generally by men of the Malo caste. In Hazaribagh district these primitive rafts are used, but dug-outs are in use in the adjoining district of Lohardanga. A form of *chatty* raft (*gharnao*) is in use occasionally in the districts of Tiruchchirapalli and Tanjore, Tamilnadu.

In the fort moat at Vellore in North Arcot district, Tamilnadu raft is made of two inverted *chattis* (*gharnao*) connected by parallel bamboo rods on which a man sits upon a little saddlelike bundle of reeds together water-lily (*Nymphaea lotus Linn., Nymphaea pubescens* Willd) leaves for use as food platters by high caste people. It is also used occasionally in the same way in tank fishing with the seine net. Sailers often get away from thé wrecked ship on a raft. Coracle is a kind of bamboo circular basket plained in open hexagonal technique and is used as a means of water transport in hilly rivers where there are subterranean rocks, boulders and high current. Wicker coracle is found on the Tigris at Bagdad, on the Cauvery and on the Tungabadhra rivers in South India. A piece of leather is stitched on all the outer side of the basket in such a way so that no water can percolate in it. Coracle is extensively used by the people of Worth West Frontier Province (thé ancient Gandhara) and in the rivers of the Godavari and The Krishna in South India. Simple dug-out is developed from the floating piece of timber. A dug-out is the lower end of the truncated trunk with larger girth of the palmyra tree (*Borasous flabellifer* Linn.). The butt end of this palm tree is used and the inner pithy portion of it is scooped out longitudinally with axe and adze having a closed end and an opened ent at two proximities. The dug-out used in *bils* and canals, particularly in rains, is known as *donga* in Bengal and *ekhta* in Bihar. At the time of use, the opened end is plugged with mud so that no water can enter inside of it. This is the very simple type of water craft. Almost each family of Lower Bengal has a *donga* and poor families have *dongas* for daily communication to places for going to weekly village *hat* (market). A considerable quantity of goods can be strored or several passengers accommodated if they sit close together at the bottom. The size is 11 to 13 feet in length with and diameter at the fore-end of 2'6", while the narrow posterior position is not greater than 10 or 11 inches. All *dongas* are not made from palmyra palms. Inferior dug-outs are hewn from the trunks of mango (*Mangiferaindica* Linn.), *jarul (Lagerstroesmia flosreginae)*, *sal* and *shimoll* (Cotton *Salmalia malabaria* Schott.) tree. Dug-out made of sal tree receives the name of *salti*. People can travel easily in bils and small brooks. *Donga* is not suitable to play against current water. Dug-out canoes are found in Burma and Malabar.

People cross the river by boat. The most interesting vessel built by the primitive tribe is the dug-out canoe comprising of the one plant-built boat. The Andamanese of the Great Andaman islands travel by canoes. Canoe is a both moved by one or more paddles. Such canoes are of two types— (1) Simple canoes and (2) Out-rigger canoe. Simple conoe is made of a single dug-out without out-rigger and the out-rigger canoe has balancing pole(s), which again have two sub-types-(2a) One with single out-rigger on one side of it only and (2b) with double out-riggers, one on each side of it. The first sub-type plies near the shore of the sea, while the second sub-type plies in the deep sea. Double out-riggers balance the canoe(s) from both sides and canoes never turn up side down by strong waves in turbulent sea. Double out-riggers canoe is the representative of high technical achievement in primitive boat building. To make a canoe a soft wood tree is selected and cut it down. Then the bark of the tree is removed from its trunk and the middle part of it is hollowed out with an axe and adze. Often smoulding charcoal pieces are put in its middle portion at intervals in a line and when a considerable portion is burnt then the portion left is scooped out. When the canoe is made then the out-rigger (s) are attached at will. These consist of stout poles of light wood, which act as floats and these floaters is attached tightly with cane strips to the canoe at gunwale with straight sticks of tough wood. The Andamanese use paddle in deep water, while the canoe is manipulated with a tall pole in shallow water.

Boat is built up in joining planks of wood on both sides of a keel. A boat has a stern and a prow. Boat is the main water transport in riverine Bengal. Local terminologies for boats change according to use and location, and the same, type of boat may have different names in different places, for example, Kosha may mean either any boat without a prow (*goloi/golui/asa solai*) or a flat-bottomed boat. *Jaile/jaliya dingi/dinga/dinghy* and *bachari* are the two types of boat used by the fishermen of Bengal. *Jaile dingi* is a small boat with a hollow inside, which is covered by bamboo small trips carrying *shangla/sangla* net for fishing *hilsa* fish in the Ganges. The *jaile dingi* used with the triangular dip-net, called bhesal/ vesal *jal* (net) is nearly identical. It has no awning (*chhai*) to protect men either from the sun or from rain. Arched roof of matting is half barrel shaped, made of bamboo splits or reeds. Generally one man can ply such a boat with along bamboo pole, locally known as *laga/lagi*. *Bar dingi/alag bachari*, *vauliya* (used by the dacoits of Lower Bengal), *chhandi* (used for fishing with pelagic drift nets in the estuary), *bhar* (for carrying heavy commodities), *mantaj, patatan, hola/ola/kola* (for carrying coal, sand, bricks, stones), *paruliya, bishtupuria, bhadrakullai, khanjarkatri* (for carrying wood from the Sundarbans to Kolkata) and *bajra/ badjra* (for rich men as pleasure boat) are the different types of boat used in Bengal. The oared *patia* at Digha, Purba Midnapur and Talsari, Orissa are used exclusively for beach seining. Seine-net fishing from beach is one of the most labour-intensive fishing activities and generally speaking, it is undertaken by the poorest people. At Digha, seine-net fishing is timed to take place during slack water before the ebb so that the net can be more readily controlled. The net is shaped like a funnel, the mesh size decreasing towards its bag end. Oared *patia* has oarsmen (*danri*) and steersman (*majhi*) stands to his task, using a steering oar, which is longer than that used in the sailing *patia*. Seine-net fishing is undertaken at Digha mainly during the rainy season in June to August. The steersman is in command and calls the strokes for the passage through the surf, which is always hazardous, especially during landing. Passenger boats, from the ubiquitous little *dingi* to the slow moving bajra give life and animation to the scene. Small rowing boats, like canoes, dug-outs and *dingis* are used mainly in rural areas for transporting people, private belongings and crops. *Bachari*, a market boat is a big one with high up edges for carrying miscellaneous sundries rather than passengers. It has a covering at its helm side. A long mat-roofed cabin with side and end doors occupies the greater part of the deck. A mast carrying a sprit-sail (*kani dadam*) is stepped far forward. The usual quarter sculling paddle is used. The larger *korpai* of Khulna and Faridpore districts in Bangladesh, used for the transport of paddy has similar poling gangways. Two men ply this type of boat upon waters. It is found in great numbers in the Jessore and Khulna districts carrying perishable goods to the village *hats*. The smallest boat with covering is the *taburia*, plied by one man. Ubiquitous one-man passenger *dingi/pansi/panshi* with a semicircular roof that loiters hawk-eyed in crowded waterways. Usually the boatman squats after paddling and steering the little craft. A tall bamboo is stepped abaft the thatched cabin and a thin cotton sprit-sail is hoisted, high enough to enable the boatman to see ahead. Wind action moves a boat faster by sailing it. Expert boatmen can boating more quickly with many sails. *Punchi* is plied by two persons, one at the helm at stern and the other with an oar (*baitha/dnar/ hal*) at prow. The boat is propelled occasionally by oar over the starboard quarter. On seals from Chandraketugarh *trapad/trapadak* and *jaldhislak/jaldhisatru* are written in Kharosti-Brahmi inscription for boat. From the same site copper coins show representation of boats But the technique of boat-building and who were the makers of these boats are not identified

Dopatia and *tapatia* are cargo carriers plied by two or three oar men respectively, besides the helmman. Their awnings are bigger. The *chhoat* of Orissan waters and some of the Bangladesh river cargo boats known as *pallor* and *patam* have hulc planking, surmounted by one strake or by several strakes, which run(s) the full length of the vessel. Yet, externally and internally, these three types of boat are smooth-skinned and certainly not reverse-clinker. Nevertheless they are edge-fastened strakes overlap in a half lap within the thickness of the planking so that, outwardly, they appear to be flush laid; they are fastended together within this half lap by boat-builders' staples. In the Ganges and the Padma these boats are plying — (1) *Putelee/Patile/Pataily* – a large cargo boat, (2) *Patunga/Patella*—a large flat—bottomed sailing boat of the river Hugli and (3) *Purgoo/Porka/Purga*—an oared, possibly also sailed vessel, which carried cargo in the river Hugli and Balassore in Orissa. This type was first mentioned in the Bengal records of the East India Company. Reverse-clinker cargo boat known as *shoronga* is used in Kisharganj, Brahmanbaria and Habigonj districts of Bangladesh. The lumbering craft used for heavy traffic on the Ganges are still fuller of human interest than the smaller ones. The *malar panshi* is one of the smallest of this class. Merchant boats are *bhar, malangi* and *kisti*. Other boats prevailed in Bengal are *balam, teddy balam, gachari, dorakhal, kathami, goda, slup, chhip, salti, mantaj, patatan, patam, kosha, kosh, sampan, konda, garab, ghasi, jong, mallar, paloani, bedi, bhudi, raptani, masuya, patila, patia, tapur, babliya* and *bajra*. Ceremonial large *bajra mayurpankhi or makarmukhi* or swan-shaped (*samsamukhi*) pleasure boat glides down the river. In Kashmir travellers live for a short time ostentatiously in house-boats in the Dal lake. Banaras *badjras* are much in evidence for the use of sightseers and pleasure parties for leisurely travel with a favourable breeze and current. These are usually brightly painted in bright colours, sometimes with some attempt at ornamentation. The *bhaulia* of Khulna, the *kosh* of Barisal, the *pinish* of Dhaka and the green boat of Hugli are different types of *badjra*. The *badjra* is the largest and most spacious, 30 to 50 feet in length, 8 to 16 feet in breadth and 4 to 6 feet deep. The deck space is entirely occupied by a flat-roofed cabin. The rowers, two to four on each side, are located forward. The *pinish*, the *bhaulia* and the green boat are smaller boats and are used in picnic and *shikar* (hunting) In Dhaka, Gaffargaon and Mymensingh *kosha* boats are mostly used for racing. These boats are narrow in shape and can be as long as 150 to 200 feet. Their front and back are straight. In some cases the backs are about 5 feet above the water and their fronts almost touch the water. Their front and back have many decorative works. In Sylhet in Bangladesh *sarengi* boats are used for racing. These are about 150 to 200 feet in length and 5 to 6 feet in breadth. Their front and the back are flat like the beak of a duck and remain 2 to 3 feet above the water. In Chittagong, Sandwip and Lower Noakhali areas *sampan* boats are used for racing. These are made like ships. In Dhaka and Faridpur *goyna* boats are used for racing. These are 100 to 125 feet in length and have a breadth of 8 to 9 feet in the middle. Their front remains 3 feet above the water and the back remains 4 to 5 feet above the water. Sometimes the Malla fishermen take these boats to the Sundarbans when they go for fishing turtles. Only a sprit lugsail is used.

Boats are also important as vehicles of sports are entertainment. The *nouka-baich* (boat race) is a major attraction in most parts of the country, especially during the rainy season. This race demonstrates the boatmen's technique and prowess in giving their boats the maximum speed. Boatmen have their own songs with typical lyrics and rhythm, mostly boardering on melancholy and devotional themes because of the threats posted by sudden storms and tidal surges. Life of the boatmen and their relationship with rivers and the sea naturally fascinate poets, writers and artists.

Whether or not fishing and other seafaring activities have ever been exclusive, the historical importance of the maritime wealth of Orissa is still reflected in folklore and floktales and commemorated in cultural festivals. The boat is featured in and forms an integral part of the festival of *Kartika purnima,* when thousands of tiny boats of cork, coloured paper of the bark of the banyan tree (*Boita bandana*) are set afloat to celebrate Orissa's maritime past. The festival of *Chaiti ghoda* is also of great imortance to Orissan fishing communities. A culture in which boats find so special a place must have had a long association with the sea. Boat racing with rowing and racing skiffs is an enjoyable water-sport in the Titas river in Brahmanbaria and Khalia in Jessore districts, during *Durga Puja* holidays at Panchgharia in Habra in Nangla *bil* (in North 24 Parganas) and in Kerala in the South during Pongal festival. In boat racing at Nangla *bil* women also participated.

Patia is a boat found exclusively in the Digha area adjoining the Subarnarekha river in West Bengal and in coastal territory of Orissa. The maximum length of this boat is 30 *hat* (I hat = 1.5') = 45' and the minimum 10 *hat* = 15'. Patia reverse-clinker sailing boats are found at Kasafal, north-east of Balasore and at Talsari on the northern shore of the Subarnarekha estuary, close to the border of West Bengal.

The economic significance of the north-western coast of the Bay of Bengal and the importance of its ports as a commerical like between East and West in attested from at least Roman times. 'The Periplus of the Erythrean sea' mentioned that big-sized *kolandia* boat carried good from Bengal port Gange to Chirse, Java, Borneo islands in the last half of the 1st century. From the 2nd century, A.D. this region supplied spices, diamonds and precious stones to the Roman Empire from the Orissan river ports, like Jagannatha-Puri, Cuttack, Konarak, Pipli, Balasore and the mouths of the rivers Mahanadi, Brahmani, Baitarani and Subarnarekha. During medieval times, C. 12th Mid 16th century, earlier trade links with South-East Asia, Sri Lanka and beyond to China were expanded with the export of commercial crops, grains, industrial products, such as textiles, perfumes, diamonds and ivory. Towards the end of the medieval period the economic prosperity of the region fell into decline, partly due to competition from Arab, Portuguese and Dutch traders and partly due to the threat of Muslim invaders. This, coupled with increased occurrence of natural diasters, such as drought, famine and cyclones, the gradual siltation of the water-ways and the progradation of the coastline eastwards, brought about a reduction in maritime commerical activities and rendered many of the ports obsolete, isolated some kilometres inland or longer accessible from the sea. The reverse clinker tradition is also found in the south Midnapur area of West Bengal.

The wood used in *patia* making includes a wide variety of materials. These are *arjun (Terminalia arjuna), babla (Acacia arabica), sirish (Albizzia lebbek),* black *sirish (Samania saman), sal, jarul, sundari (Heritiera fomes), karai and garjan.* Of them *sal* is prized for its hardness, but is too expensive and the life of a boat made of *sal* is much longer than that of *arjun. Arjun* is the most popular choice, because it is lighter and has a greater affinity for saline water. It is cheap and is much available locally. Bangladesh boat-builders use *sal,* teak (*Tectona grandis*). But these timbers become difficult to obtain and for that timbers as *subdari, garjari, zarail, kanthal* (jackfruit-*Antocarpus integrifolia shilkkoroi* and *koroi* are now used. Jam and mango are used for the bottom planking and *gamma* (a very red coloured timber), for the side strakes. Seasoning of timber is important in boat making. Boats made with properly seasoned timber are expected to last longer and require fewer repairs. Two methods of seasoning are (1) Sun drying and (2) Immersion in water.

Fishermen, who fist at sea in *patia*, tend to shore their vessels, when not in use. Boat making wood in obtained from wood merchants and sawmills. The sawmills are located at Ramnagar and Kanthi in *Purba* (East) Midnapur. Owers buy wood of their choice from the wood merchants and get these sewn into planks under the supervision of the head carpenter. The master carpenter prefers wood with the desired sap content. The wood is measured in cubic feet, called *sefti* locally. The term *sefti* is probably derived from English cubic feet, transpositioned as 'se' denoting 'C', pronounced as 'S' in cubic and 'efti' signifies feet. Unlike the West Bengal *dingi*, which is stapled, the Orissa *patia* is nailed. Iron nails (*perek/jolui*) usually of Between 4" and 6" in length, are procured from local hardware shops.

Patia building is not a commercial activity as is the case with *dingi* construction at Sripur, Balagarh in the district of Hooghly in West Bengal. In Digha, Niranjan Das of Gangadharpur village and Sudhir Jana are the patia traditional builders. Unlike Balagarh, where the fixing of staples by hammering, *perek*, wire nails, caulking and *gaoni* are handled by specialised groups. Usually, one and of the staples is flat and the other is pointed. The trawler at Kakdwip, Sundarbans in South 24 Parganas master carpenters can be young and Kala Chand Dhali is a such one. In Orissa, *patia* builders live in different parts of Balasore district. The main centres in Orissa include Kirtonia, Ranasingpur, Bichitrapur, Krishnangar, Padmapur, Gompharia, Sahapur, Duttapur villages. Others lie scattered along the banks of the river Subranarekha comprising the villages of Bishnupur, Baliapal, Bodapal, Rosolpur, Sahadondor, Banskhana, Lakshmipatra, Noyabali, Pachimpar, Chursara and Ekiripal. The traditional spills over to Digha at the village of *Paschim* (West) Godadharpur, Gangadharpur, Balagarh. At the Sripore *bazaar* (market) in Balagarh boat industry is famous. Boats made here cost Rs. 2500. Sri Nimai Chand Barik and Sri Ganesh Paramanik are the skilled boat makers. In the past the boatmen and boat makers were not very efficient in wood treatment and preservaiton. But they had a good knowledge of how to season wood and apply coal tar coating for resisting the penetration of water and protect the wood from decay. Wooden boat making was done by carpenters, who did not have formal training, but acquired the skill by apprenticeship in the profession, which was mostly hereditary in nature. Boats are purchased mostly by the fishermen and jute farmers across the State. Bariks of Rajbanshi community are traditional master boat-builders. The Kaibarta caste is usually associated with fishing. However, at Kasafal, the fishermen belong to more than one castes. Reverse-clinker (*digekata*) boat has a *golui* at each end. *Golui* is the term applied to the block ends, which almost all types of Bangladesh river boat have. Some *goluis* are long and pointed, while others are blunt and rounded. In *digekata* boats, *goluis* are board block-stems, rectangular in plan at their ends and with a wedge-shaped cross section, which rise from the hull at a shallow angle to the horizontal. Conversely, on boats without reverse-clinker, *golui* can rise sharply at steep angle.

Dingi is essentially a riverine boat, the *patia* is well attuned to coastal waters and it has a keel (*danda*). The different parts of a boat are hull (body), prow (*asa solai/goloi/golui*), stern (*pacha solai*), oar (*dnar*), rudder (*hal*), mast (*mastul*), sail (*pal/badam*), cabin (*chhai*) and deck (*patatan*). The transverse structural elements consist of *baka* (the floor), *guina* (the *bilga* frame), *gocha* (the side frame) and *gura* (the deck beam).

The *patia* is said to be regarded by fishermen as a living spirit that not only provides them with a livehood but also protects them from danger. In the Cuttack and Puri districts, southern Orissa boats are identified with the goddess *Mangala*, whereas in Kasafal, Talsari Digha boats are associated with *Kali*. The farward-facing face of the patia's stem is inscribed with eyes, nose and mouth representing a stylised head, which very from boat to boat. A full figure of *Kali* is carved crudly on the starboard planking and the figure is covered with vermilion and incense sticks are put before the boat sets sail.

Different tools and instruments used by the Bengal boat-builders (*mistris*) are various types of chisel, hammer, auger, *matam* for angle ascertainment, *kurjyut* for drawing lines, tape for measurement, cord, plumb-line, *B-karan* (an indigenous compass) and *basa* (for keeping wood up wood, looking like stock), and the woods required for boat-building are *segun, sal, asan, halak, gamar, sodal, arjun, babla, sundari, gangajarul, jarul, side, chap, jam* and tamarind, and the first seven varieties are imported from outside. Other items required for country boat-building are bamboo, four angled nail, steple (*jolui*) (bladed at two sides), iron wire, jute, nylon cord, tar, cotton, canvas for sail *(pal)* Small pieces of wood is fixed to the longer plank and are commonly known as *chheya*. The joint is known as *chabiset*.

Helm, oar and paddle are the accessories for propelling vessels. Paddle are generally used in canoes, while oar and helm are used in boats. Paddles are generally rowed by both hands and feet, but oars and helm are tied by string to the rim of a boat and are rowed by hands only. The oars (*pathaduar*) have long wooden blades tied to the ends of bamboo poles. Often vessel is propelled by several standing oarsmen, some pushing, some pulling. Sometimes boat is steered by a steering oar over the aft. Two oarsmen sit amidships on the third and fourth crossbeams, with their bare feet braced against the fourth and fifth crossbeams. The each pull on oar pivoted in a rope grommet, which is attached to a side timber forward of the fourth and fifth crossbeams. An angled spar is lashed to the top strake through a hole in the planking. The loom of the oar, within its grommer, takes against a groove in the forked timber.

A boat is plied with a bamboo pole and poling is the earliest type of power for propelling a boat. Paddle is a spoon-like blade wood with a handle for flippering a boat. The bladed end pushes water backward and as a result the boat moves forward on water. Oar is a long wooden flat piece, which is tied to the gunwale of a boat. When rowing boat, oar is pulled towards the body of the operator. For towing a long strong string is tied to the head of a boat and is pulled from the bank of the river usually manually in Bangladesh or sometimes with animal power to move forward. It is known as *gun tana* in Bangladesh. Towing is done to carry paddy, jute, vegetables, earthen pots and the like across a river. Sailing a boat is done by wind action. A sail is made of woven polyporplylene sacks of varying sizes, with reinforcements at the corners, all sewn together in double hems. Once the sail is hoisted, the halyard is used as an angled backstay by securing it to the windward projecting end of a beam. Sail (s) are fitted usually to the central pole of a boat. In modern times motor boat. In modern times motor boat, streamer and ship are steered in the rivers and seas by stream, produced mostly by petrol engine or coal mechanically. Ship is a sea-going vessel of considerable size. Merchant ship and warship are varieties of ship. The largest water-logged vessels are undoubtedly the Viking ships at Oslo in Norway. There are three superb examples the Oseberg ship, the Gogstad ship and the fragmentary Tune ship. These show clearly how much vessels were constructed. The exact size and shapes are recorded by taking plaster impressions while the ships were still wet. Today men consider themselves masters of the rivers and oceans. Life-boat is specially built for going to the help of persons in danger of sinking at sea along the coast or is on fire with life-buoy. The life-buoy is a belt in the form of a ring, through which a person puts his head, shoulders and arms. Craft of all kinds are lying anchored by a grapnel at the harbour when not used. An anchor is a heavy piece of iron with a ring at one end to which a cable is fastened and is used for keeping boat or a ship fast to the sea bottom.

W.W. Hunter stated, "1. The pinance is chiefly used for the accomodation of Europeans. It has usually two masts and two cabins... 2. The *bajra (budgerow)* is used also for Europeans as well as for rich natives. It has one mast and two cabins, is square-rigged with a crew of a captain and from eight to sixteen men, flat bottomed and draws very little water. 3. The *bhanlia (bhanlesh)* is a rowing boat, generally of four or six dars and with one small cabin. 4. The *mayurpankhi* (peacock-feathered) is a native pleasure boat. Its peculiarity consists in the canopy or state cabin being in the front of the vessel. It is usually propelled by means of hand paddles. 5. The *patila* of Katura are boats from the westward. Their great breadth gives them a very little draught of water : they are used chiefly for cotton and light goods. 6. The *ulakh* has a sharp bow and a smooth rounded side and is generally used for grain. Besides there are to be found the Dacca *palwar* the *bhadrakulia* or Sunderban wood boat; the *Magh* boat from Chittagong; the Tamluk salt boat; the *hola* for coals; *dinghi* or the ferry boat; the fishing *dinghi*; the *salti* and *donga* all varying in size, form and construction and applied to all purposes. The *salti* is a narrow boat or dugout cut from the trunk of a *sal* tree and drawing about eight to nine inches when laden. It is from twenty to thirty feet long, one foot in breadth and about the same in depth. The natives generally use it in poling from village to village". L.S.S. O'Malley worte, "The grater part of the inland traffic is carried by country boats, the largest of which can carry as much as 150 tons. They are generally very broad in the beam and of light draught and have a large square sail. Against the wind they are rowed of paled if the water is shallow; but as a rule, they travel with the tides, going up one river with the flood and down another with the ebb, and anchoring when the tide is against them. The local boat is called a *pansi*, it is a broad bottomed boat, with a thatched cabin and a deck made of bamboos or planking.

The *dinghi* is generally used in the larger rivers for passenger traffic. This is 25 to 30 feet long and has a breadth of about 4 feet. It has a bamboo mast and an arched roof of matting in the middle affords protection against the weather. Its average burthen is 12 to 15 maunds and it is managed by two men, one in the bows and the other (who steers it) in the stern. Traffic on the smaller streams and across the swams is carried by light dugouts, which are paled in shallow water and paddle in the deeper channels. One kind, called the *danga* or *salti* is made of the hollowed out trunk of a large tree or *sal* tree (whence the name), and is some 20 feet or more long, 2 feet broad at the gunwale and about 2½ feet broad at the bottom, which is flat. Sometimes a small matting roof is rigged up in the centre. It is propelled by two men, one at either end and a European has to travel in it sitting down: it would probably upset if he tried to stand up. The *telodonga* is a much smaller dugout, made of the trunk of a palm tree, one man paddles or poles it and it can carry only one passenger seated precariously at the other end...., for some are barely 9 to 10 feet long by one foot breadth and depth".

History gives us information that the Royal Indian Navy, with its personnel raised from

1200 officers and men at the commencement of the war to about 30000 by the beginning of 1944, had notable services. Though India's ship-building industry had not yet satisfied legitimate national expectations, it may be noted that ship-building yards were opened at Vishakhapatnam in Andhra Pradesh in 1940 and within two years 4000 sea-going ships were repaired. In April, 1947, the Reconstruction Policy the Sub-Committee on Shipping recommended and planned development of Indian Shipping on economic as well as strategic considerations.

Ship is capable of crossing open waters. Boat is generally a smaller craft. The term formerly was applied to sailing vessels having three or more masts, in modern times it usually denotes a vessel of more than 500 tons of displacement. Submarsible ships and one-carrying vessels on the U.S. Great Lakes and generally called boats regardless of their sizes. By about 2000 B.C. the minoans on Crete had developed ships that had log keels with ribs and planking on the sides joined at the stem and stem. The keel was bent upward and forward of the joint between the two sides of the ship to form a double or bifid bow. The long, narrow rowing galley became their warship. By Greek and Roman times it was powered by as many as three tiers of rowers. In order to reduce the space taken up by rowers, designers of merchantmen increasingly relied on sails for propulsion. Roman models had sails that could take the wind from about 45^0 off head astern, giving them greater manoeuvrability. During the Middle Ages the introduction of carnel planking on Mediterranean for the construction of much larger merchantmen, called *nefs*, which were fitted with lateen sails. Triangular in shape and set in a fore-and-aft configuration, the lateen made it possible to sail into the wind. While the *nef* was being developed, the Viking ships were refining their double-ended fighting galleys. These ships had a high bow and stern, a stoutly built hull of clinker construction that was also flexible and a single, large, reinforced square sail.

Over the next few years the features of the two types merged in the carrack, the forerunner of the galleon. The development of sets of smaller, more efficient sails was the beginning of the age of the full-rigged, classic ship, in which a combination of square and lateen sails was used. Both merchant and fitting ships began using the same basic hull design. By the end of the 15th century, ships were capable of sailing anywhere in the world. In the mid 19th century sailing ships reached their peak with the sleek, swift clipper ship, but by the end of the century steam power had almost completely replaced sails.

The history of the modern ship began in 1801, when the British engineer William Symington developed a practical steamboat for towing barges. By 1850 sreamshops were competitive with sail in terms of speed and ocean crossings had become routine work.

Early steamships were driven by low-pressure engines and power could be increased only by building larger engines. By 1970 the limit in size had been reached. Attempts were made to increase steam pressure by building more efficient boilers and designing engines that used the same steam two or even three times. Meanwhile, the screw propellor was perfected and replaced the paddle wheel, which was vulnerable and tended to come out of the water when the ship rolled.

A major revolution in ship propulsion occurred in 1884 when the English engineerr Charles Parsons demonstrated the first successful stem turbine. Turbines were far more efficient and easier to built than reciprocating steam engines, but they spun too fast to allow propellers to turn at efficient speeds. This problem was solved by about 1910 with the introduction of reducing gearing.

Throughout the era of the sailing ship wood was the chief construction material use. The ancient ship-builders had a good knowledge of the materials as well as the varieties and properties of wood, which went to the making of ships. Planks were nailed to wooden ribs that were mounted on a wooden keel. By the 18th century sheathing and later iron cladding was used to protect the wooden hull. The first all-iron ship was built in 1818, the hull being formed of iron ribs. In 1880 steel began to replace iron and by about 1950 it became practical to built all-welded ships.

The construction of larger, faster and safer ships from the mid 19th century gave rise to a large and highly competitive passenger industry.

The expansion of postwar international of trade, however, created a boom in freight traffic. Specialized carriers for such bulk commodities as grain and oil had first appeared in the late 19th century. Other types of modern specialized vessels include the roll-on-roll-off (ro-ro) ship, which can be loaded and unloaded by trucks that use ramps between the ship and the dock and the Lash (lighter-aboard-ship) vessel, which can carry a number of lighters (barges) in its specially designed hold.

Nowadays motorised boats used as ferries are somewhat greater in size. The timbers used in these powered boats are generally of greater scantlings and their framing is reinforced to cope with the installation of an inboard engine. These are generally stronger all round. There are side timbers in between the floors; the crossbeams rest on beam shelves and inwales are fitted along the top strakes to stiffen the hull. Bottom boards are also fitted and there is a special structure for the post side rudder. Some of these ferries have a short awning wover the engine; while others have a longer one to protect passengers.

It was not until the 16th to 19th centuries, during the time of European expansion, that maritime activities were revived and important centres of maritime commerce and ship-building were established along the coast. In 1514 the Portuguese established a base at Pipli, some 6 Km. from the mouth of the river Subarnarekha. Around 1625 the Dutch established an important commercial port at Balasare, which was eventually to replace Pipli after flooding of the Subarnarekha washed away that port and a hazardous sandbar began to form at the river mouth. The harbour established at Flase was said to be the best harbour along the coast and provided access to the Mahanadi delta, while the port at Dhamra guarded the estuaries of the Baitarani and The Brahmani rivers. The port of Sartha, situated at the junction of the Panchapara and The Sartha rivers, to the south of the Subarnarekha was served by an open roadstead. Churaman was established on the river Gammai and, to the north, the smaller port of Laichapur was developed on the river Kansbans.

Many different boats were noted on the Bay of Bengal coast from the mid 16th century onwards. They included the flat-bottomed *patilla*, the *purgoa*, used at Balasore and Pipli to load and unload grains, the *malangi*, used for transporting grains and small *holah*, which carried salt and textiles to Cuttack via inland waters. With the increase in commercial activities, ship-building expanded at Pipli and Balasare, using timber from the forests of Sambalpur, Balasore, Cuttack and Ganjam. However, throughout this period of maritime expansion, no attempt was made to prevent the rivers from silting, to dredge the sandbars that increasingly formed at river mouths or to buoy the channels and thus the decline of the ports was inevitable. However, traditional boats continue to be used by fishermen in estuary mouth and in coastal waters.

Archaeological discoveries are restricted to a chance find of timber from a 16th century barge in an abandoned tributary or the river Boro Bulong at Olandazsahi, near Balasore. Despite the otherwise adverse tropical climate, which would usually result in the rapid deterioration of organic material, the anaerobic nature of the deltic alluvium can preserve boat and ship timbers.

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MARKETING AND AUDIENCE DEVELOPMENT IN MUSEUMS

Baisali Datta

Museums in the closing decade of the twentieth century are drawing larger audiences and offering a greater variety of exhibitions, programs, and services than ever before. If the number of new museums and museum additions is any indicator, the museum world is reaching audiences and acquiring a visibility in some cases rivaling that enjoyed by popular culture and the mass media. Museums offer experiences, ideas and satisfactions not found in other places. These derive from authentic objects of nature, history, science, and the arts that museums collect and display; the sensory experiences with 3-D objects that museums present and interpret; and the research, scholarship and interpretation that support museum collections and exhibitions.

Competition, limited resources, building a wider audience, generating earned income, capturing the enthusiasm of young people, building collaborations – these are only some of the challenges facing today's museums, history and science centers, zoos and botanical gardens. In this long-awaited answer to one of the most pressing challenges facing today's museums, time has come to analyze how museums can build revenue, audiences, and resources while maintaining and advancing mission. Rather than seeing marketing as at odds with mission, the importance must be given on the strategic relationship between mission, audience, and funding -and how managing this relationship is vital for a successful museum.

Museums and the Marketing Mindset

Marketing is the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods, and services to create exchanges that satisfy individual and organizational goals.—American Marketing Association. It's getting people to want what you have.'' That belief about marketing is a common one. And it's at the core of a lot of the marketing problems many museums have.

Think Outside-in, Not Inside-out

Thinking of marketing as the process of getting people to want what you is the *inside-out approach.* Unfortunately, it's a one-sided, afterthought approach that only works if what you "have" also happens to be what people need and want. As Rebecca Leet, author of *Marketing for Mission,* puts it, "what people *want* has a great deal to do with what they purchase–with their money, their time, their energy, or their attention. Whether you're selling a commercial product or a nonprofit service, unless it meets the desires of people, most of them won"t buy it.""

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Real marketing requires an *outside-in approach*, which Leet describes as "a mindset even more than a set of skills. The mindset is based on achieving mission through identifying what the client (or customer or supporter or volunteer) needs and desires and then delivering programs that achieve mission by being structured responsively to client needs and values."

Many museums, though, have a difficult time adjusting to the idea of needing to develop a marketing mindset. As consultant Will Phillips wrote in an excellent 1996 article, *Linking Objects with Audience*. "Historically, museums emphasized collecting and understanding objects and specimens, not audiences. The resultant strategy played on a field of dreams: Collect it and they will come." But today, as Phillips notes, audience needs and values must become a primary focus if museums want to attract more visitors. The new mantra needs to be *"Know them and they will come."*

Knowing, Respecting and Responding

Knowing, respecting and responding to audience wants and needs is the key to effective marketing for museums. As Phillips says, "The audience requires as much respect and consideration as the objects museums so lovingly manage." Developing a marketing mindset requires us to look at our audiences as customers, to see our museums through their eyes, and to adapt our facilities and programs to meet their needs and wants.

"This doesn't mean 'dumping down' the content but "it just means making it accessible. And that means recognizing that people have different modes of learning and different attitudes around learning.

Marketing Shouldn't be an Afterthought

Unfortunately, too many organizations relegate marketing to afterthought status, confusing it with promotion, which is only one of its components. Exhibitions, special events, education programs and even new facilities are often completely planned before marketing is even considered. The "product" is conceived and developed in a vacuum—then tossed over to "the marketing people" to "sell."

That kind of inside-out approach minimizes marketing's importance restricts its potential effectiveness and helps perpetuate the marketing fears and disdain still prevalent in many institutions today.

Getting rid of those fears and adopting a marketing mindset, requires that everyone in the organization become a stakeholder in the marketing process. First, by understanding what marketing really is—and that it supports mission rather than undermines it. Then by making marketing a museum-wide function and an integral part of all planning—an inclusionary process that allows ideas to be freely expressed. Only then can inside-out truly be replaced by outside-in.

"Audience" Doesn't Just Mean Visitors

Effective museum marketing requires us to integrate our own needs and desires with those of our audiences—all of our audiences—in order to create exchanges that satisfy both their goals and our own. But many institutions make the mistake of equating the term audience only with visitors. In actuality, though, members, donors, staff and volunteers are audiences too. Looking at them in that way—as customers—allows us to be more mindful of the exchange nature of the relationship. And it also paves the way for marketing to become a museum-wide function.

Audience Development

Audience development is about improving services for regular visitors and taking action to reach out to new people. It's about giving a wider range of people the opportunity to improve their understanding, knowledge and appreciation of museum collections. And it's about building bridges with people by being responsive to their needs and enthusiastic about consultation and long-term partnerships.

Audience development is not the responsibility of anyone individual or simply another museum specialist, but a way of working those impacts on the whole museum and influences every area of activity.

Museums recognise that regular users represent only a small proportion of the communities they would like to be serving. By reaching new audiences, museums can demonstrate their social significance and accountability, increase visitor numbers, volunteers and income, meet the criteria set by funders and improve services for all. By involving a wider cross-section of the community, museums can draw in people with a variety of new skills and experiences. By welcoming the contribution others make, museums will improve their profiles and become better placed to reflect the diverse cultures of the communities they serve.

What keeps people away?

There can be a number of social, psychological, financial, practical, physical and cultural barriers to accessing museums. Some people do not use museums because of a lack awareness of what's offered. Others stay—away because of inadequate museum facilities, negative past experiences, or a lack of time, money, transport or interest. Others sometimes feel misrepresented, ignored, even insulted, by museum displays. And finally, people value social interaction, active participation and feeling comfortable in their surroundings; museums are often perceived as formal and formidable, with little to offer.

What can we do?

We need to build on what the museum does well, look at what we could do better, recognize the barriers (real or perceived) that restrict wider access to the institution, and then work to break down those barriers. Next to examine the circumstances of the community, the museum's image and current visitor profile, and the reasons why some people do not make any use, or full use, of your services. Then to make adjustments based on the findings.

Exhibitions aimed at particular under-represented groups can be staged, the collection policy can be reviewed to better reflect the diversity of the area, or specific projects can be implemented. Projects might aim to expand on an established audience, be directed at a group currently under-represented among existing visitors, or involve a completely new audience.

Thinking strategically

Each museum has its own existing and potential audiences, defined by the nature of the institution and the community it serves. The audience development strategy will need to reflect the history, collections, current position, structure and aspirations of the organization and the community.

To embed a sense of belonging, involvement and excitement about the work in a wider cross-section of the population, it is important that potential audiences—as well as museum staff and management—are consulted, can contribute and are supportive of the strategy.

- Assess and review current practice and policies
- Identify the people who infrequently or never use the museum and identify their geographical distribution
- Establish people's needs and aspirations through consultation, evaluation and research
- Value the aspirations, diversity and contribution of all those involved
- Develop a strategy and prioritize resources
- Establish a framework to maintain and develop the provision for regular users, such as schools
- Establish target audiences and to draw up possible program to engage those audiences
- Support staff, especially with training, to enable them to carry out audience development work
- Consult the audience to ensure ownership and commitment, and to promote equitable partnerships
- Share the enthusiasm for the museum, but be prepared for criticism
- Be flexible and modify the strategy as things develop
- Recognize the work of others and target-resources to where they are likely to be the most effective
- Work with partners: other museums, local authority departments, and arts, community and voluntary groups
- Establish a framework to maintain new audiences, especially by encouraging people to become independent museum users
- Evaluate, review and improve the work
- Celebrate success, learn from mistakes
- Have fun, make friends

A recommended process

There are no 'off the shelf research packages because specific situations require their own particular research plan. Many of us find that we follow a similar path in carrying out visitor research and evaluations. Here are some common steps along that path.

1. Define the problem or question.
2. Determine what kind of information will help to make a decision.
3. Decide the most practical and valid way to collect the data.
4. Report the information in an accessible and relevant way.
5. Store the information to build knowledge over time.

Front end evaluation

This term refers to the range of methods which can be used when evaluating a concept for a proposed exhibition, program, webpage or publication.

Meta evaluation

This refers to the process of exploring studies that are already completed with the aim of finding new insights or new questions. It is sometimes referred to as data mining.

Program evaluation

This refers to the evaluation of all aspects of a program such as a volunteer program. The visitor perspective is just element included in a broad program evaluation.

See (and listen) for yourself

Watching what happens when visitors come into personal contact with the organization can be an eye-opening experience.

Some things to be on the lookout for ,

How are visitors greeted? Are they met with an enthusiastic "Welcome!"—or with an awkward stare or a suspicious-sounding "May I help you?" Do all staff members, regardless of department, make eye contact and smile when they encounter a visitor? Do they take the initiative to offer help it: someone looks lost or confused? Or do they hurry about their own business, head down, trying to look invisible?

Who's visiting the museum? Families, groups, couples, singles, older adults? Is the mix the same or different than it was a few months ago?

How's the traffic flow? How long are the lines? Are the policies and procedures you've established to facilitate these things actually working? Are they enhancing the visitor experience or impeding it?

Are visitors picking up the handouts you provide? Reading the signs? Do they look confused as to which direction to travel in next? Do they appear weary and in need of a place to sit? Do visitors of different ages and types react differently, or are there noticeable commonalties from segment to segment?

What are visitors saying — to you *and* to each other? And what are they not saying? What kinds of questions are they asking? What are they looking for that they can't find? Are they making any new comments or requests that you haven't often heard before?

Experiencing one's institution from the visitor's point of view can tell us just as much or more than technology, focus groups or questionnaires ever can. And all that's required to gather this valuable information is getting out there and really paying attention. Today every museum should call for introspection the highlighted questions like what kind of marketing highway has our museum constructed? And what shape is it in? Does it run both ways between your organization and your community? Are all the on-ramps open? Are there plenty of interchanges for gathering information, building relationships and identifying wants and needs? The right kind of marketing and visitor management can enable museums not only to survive in these currently challenging times, but prosper in the future.

COMMUNITY RELATIONS—AN INDISPENSABLE STEP REQUIRED TO BE A COMPETENT MUSEUM

Dhriti Ray

The idea of community relations is as old as organized society itself. In India, since ancient periods virtue of philanthropy is a traditional value that was honoured by the Kings and Zamindars as part of their duty in setting-up schools, lakes, tube-wells, construction of roads, development of medical unit, promotion of art and culture etc. In the recent past community relations' programmes adopted by different corporate houses were taken as an act of philanthropy and charity. People expressed their gratitude for the same. But the situation has changed today and in the changed situation community relations has taken the 'front seat' in the public relations programme of an organisation. It is because community is no longer a passive unit, it is dynamich, vibrant and eloquent to compete with other communities. An uneconomical, unhealthy and problem behest community is not preferred for smooth operation. Pocket of neglect becomes pocket of problem. Thus organisation does not want to take any risk since a small group of people can create havoc in the success of an organisation. Therefore, it becomes a necessity for survival of an organisation rather than preference. Most organizations believe that public relations begin at doorsteps, community relations, therefore, is receiving greater attention as an important area in the public relations activities.

Museum is a public service institution in the service of society and its betterment. It has the responsibility to cater knowledge regarding our history, science and culture to coming generations to give them opportunity to know more about their country and about the world. But human psychology is changing day by day. Earlier people like to explore new knowledge themselves, but now their acceptance depend considerably on the welcome of others. Thus, rather being a passive display house now museums need to advertise itself among common people or within the community, so that people can get an idea about what the museum is arranging for their interest and can develop their interest on museum. To achieve the objective of museum to be a public service institution, it is very much essential to maintain positive community relations to strengthen museum's public relations activities.

Time has come to realize that no museum can survive in an island of isolation. It has to operate from the community to satisfy the needs of its target people to draw their attention towards museum and to grow repeated visit habit among them. Popular public service image of museums depends on the direct patronage of the community. Museums have to realize that it is not possible to survive in an island of affluence when the multitudes of people are deprived of basic demands. Success of museum and public sanction of it goes hand in hand. Museum has to contribute whatever it can for the betterment of its host community. Museum operating from a community is expected to be sensitive to community and give

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back something for discharging their social responsibility. Otherwise, no information will penetrate into society. In India the present model of museum has come about two hundred years back by the British but it is the drawback from the museums' side that in so long period of time museums fail to convince common people about its content, activities and service specially designed for them for knowledgeable entertainment and multifarious benefit. Thus, it should be considered that rather than the present conventional style of museum activities for its common visitors and target groups museums need to go to the community. It is the appeal of the present era that organisation should go first with their product or service to the community before public come in search of it. Because induction is most essential today rather than passive expectation that people will come to museum for their interest. Community relations programmes are, therefore, very much essential today to inform common people at their every footstep that what a museum is doing for their interest. Community relations' need to create favourable climate to convince target people, like educational institutions, cultural institutions, traveling agencies, social organisations etc. for the following purposes :

1. To establish museum's reputation in the community
2. To ensure museum's involvement with the community
3. To establish local identity among the member of the community
4. To dispel mistrust and misconceptions regarding museums among common people
5. To earn trust and confidence for the museum
6. To help in changing the age-old attitude of the museum

For achieving the above objectives museums need to think about its position on behalf of the community considering the following factors :

1. Interest of the community in museum
2. What museum can offer in respect of the interest of the community?
3. Determining the objective/purpose/ goal of the programme for the community.
4. Ascertaining the community's needs.
5. Ensuring museum's strength in giving continued support to the programme.
6. To decide upon the capabilities of museum-its manpower, fund availability potentiality etc.
7. Expected result for evaluating the performance.

After considering all the above factors a museum can initiate programmes for effective community relations. Community relations' programme may include many events depending on the needs of the community like public interest and their nature of acceptance and capacity of museum itself. All needs of the community cannot be tackled by the museum and as such it is necessary for the museum to decide on the programmes they are capable of executing. In fact it is a visible effort to convince people that the museum is truly a public service institute in the service of society.

Community Development Programmes

For the purpose of development of community museum may undertake following programmes according to its capability , targeting different segments of society like educational institutions, cultural institutions, societies for handicaps etc. :

1. Museum can provide 'literacy programmes' 'for street children, child workers', and 'adult education' in special hours of holidays or in suitable days. For example, Gandhi Smarak Sangrahalaya, Barrackpore, West Bengal.
2. Museum can easily assist local schools in their teaching by providing models and replicas of exhibits that are relevant to the academic curriculum. Museum can also arrange film shows and popular lectures in schools.
3. By 'imparting professional training' museum can help needy people.
4. Gallery educational programmes for school groups.
5. For the 'promotion of art and culture' museum can organize different cultural programmes, exhibitions and fairs where people can get the opportunity to see own art and culture.
6. Establishing 'water points' in the prime locations, for example in front of schools, bus stands, etc. where number of target people are gathered and can get the chance to familiar with the name and location of the museum.
7. Museum can construct 'Bus-Stand Shelter' in certain busy locations. This will draw attention of many target visitors.
8. Even with limited fund museum can provide scholarship or award in the field of art and culture for poor students who have shown outstanding performance and can also support young and needy artists as well as dying arts.

Beatification Programmes

Municipality of every city and suburb tries to decorate the place with their best effort. What ever we see at our surrounding we get quick knowledge about it like new arrivals in the consumer market, entertainment channels etc. through different attractive advertisement at the side of every roads, public places etc. All these gives a new commercial look to the city. But today many municipal corporation and many corporate organisations are decorating the city, locality and organisations like market complex and shopping malls etc. with ethnic and antique look objects.

Museum has good opportunity in this regard. It can take the responsibility of beautification with the replicas of its exhibits in Railway Stations, Airport, public sector offices, hotels, shopping centres, schools, local parks, roads approaching to museum etc. For example, the Park Street Metro-Railways station is decorated with the sculptures given by the Indian Museum, Kolkata and inhibits its public gatherings to visit the museum, situated just beside it. Another example is the modern City Centre of Kolkata, a shopping mall, here a portion of it, is decorated with the famous Kalighat paintings drawn by Jamini Roy. Museum can exploit this new trend of beautification programme and can change the outlook of common people, generating a feeling of love towards the ethnic culture, importance of antiquities. This ultimately can create an appeal among common people to preserve our reach cultural heritage for today's and coming generations'.

WHILE THINKING ABOUT THE VARIOUS MODELS USED IN MUSEUMS

Anindita Chakraborty

Museums are there to give people an understanding of its theme of exhibition. That is why the exhibition of a museum gallery needs to be so designed that visitors may easily have a clear perception of the theme. Now, the question is, what does actually make the visitors' understanding clear? Well, that depends upon their educational backgrounds and intellectual level. Of course, these are not uniform and vary from man to man. But the gallery exhibition is prepared at a time for all. So the more it is clear, attractive and lively, the more it is capable of drawing interest of people coming from different walks of life. Again, there are many such display techniques; one of them is model. Models play a significant role in this regard. Three-dimensional models, properly displayed, are very much capable of growing interest in visitors' mind. Colourful models are really attractive in true sense.

Models may be of various types and sizes. Depending upon their sizes the models may be of three types, i.e., life-size models, enlarged models and miniature models. Life size models are exactly of same size of the original object. That's why it gives a real picture of the original object. In various museums such examples are found where models of different people are exhibited. The enlarged models are larger than the original object. It actually helps in clear visibility of minute details, just like zooming in. The miniature models, otherwise called small-scale models, are smaller in size than the original objects. In case of enlarged models the extent of enlargement may be different according to the requirement and space available. Similarly there are also different scales for the miniature models. These small-scale models are space conserving and also give a more comfortable angle of view to watch at than its actual or original or life-size counterparts in special cases. Suppose, a museum is going to arrange an exhibition on the different models of aeroplanes used during the second world war and there is not enough space for providing the actual exhibits. Then it a fantastic idea to design the exhibition with miniature models and these give a better view. On the other hand, enlarged models are very helpful to give a clear view of an object which otherwise can be seen under microscope or lenses. Suppose, a DNA model is going to be shown in the gallery, then it is obvious to have an enlarged model of it. Depending on the depth of details dealt with in the models, there are two types of models, i.e., cutout models and non-cutout models. Again, depending on the mobility and the functions, the models there are of two types of models, viz., working models and non-working models or static models However, these categories may be overlapping. Cutout models give the inner details of the models. These models have an opening in one side or the other to show the inner details These opening areas are sometimes equipped with door like fixtures, which can be opened to facilitate the visibility. Non-cutout models are so prepared that they look very natural from outside, so inner details are not always required so strictly. However, where these models are made up of transparent materials to show the inner area then it becomes necessary to give the exact inner details. Lighting should be done properly. In the cutout models, besides the lighting arrangement on the outer sides of the models, inner sides also may be fitted with lighting fixture to facilitate visibility.

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Working models and static models are easily differentiated with the mobility of the parts of the models. Static models are fantastic to show a view of a house or the like which need not be demonstrated with an action. On the other hand, the prime necessity in case of working models is to demonstrate an action step by step. Suppose the upward pressure of wind force is to be demonstrated, then the model should be so designed so as to the effect of upward pressure of wind can be exhibited through motion as well as an upliftment of an heavy object, e.g., miniature model of a roof of a house blown up by the wind. This action can be made realistic with simulative roaring sound of stormy weather. Static models are less likely to be damaged, as these have no movement of their own. Working models are therefore are to be placed carefully as to maintain their performance during movement. Again, they require power supply in some cases. These may be supplied by various modes, especially electricity However, museums with such models may consider of an alternative energy source, such as inverter, generator etc. A few working models can be run by solar energy as the case may be. The course of action may be stated in brief either by labels, or by interactive voice system or by guide lecturers present in such galleries. Moreover, light and sound systems, interactive voice programs, push buttons, radio-waves, Ultra Violet rays, LASER beams, remote controlled systems, robotics, magnetic fields, 3D-shows etc. can be incorporated to these models to enrich the quality and boost the perfection of the models. Researches are carried out to imitate the movement of animals to make the models of animals more lively. Besides the mechanical tricks applied in such models, special care is taken to form the surface area very impressive.

Visitors are sometimes allowed to touch these models to make them work. Sometimes, their intelligence is challenged to make the system more attractive. Clear understanding thus here combines with real pleasure of a game, a game to participate in and to win, and sometimes, to measure something in one viewpoint or the other, to guess and to analyze. Now, the trick is to combine these techniques carefully as and when required during the planning and designing of the working models. Sometimes, dioramas are also equipped with these magnificent working models and thus they look more realistic during motion.

Models are very helpful indeed to create clear perception about a theme. It has an advantage in contrast with two-dimensional pictures or photographs due to its three-dimentional feature It can be seen from all possible direction if kept with expertise. It has another importance also. When the original object cannot be shown anyhow, the model can fulfill the necessity of display purpose. Again, before fabricating a large object, a miniature model of the same can be prepared to determine the final step. That's why; sometime some newly built museums have in their collection the miniature model of the whole museum.

Models can be made up of different materials according to the necessity availability and proper functioning such as wood, resin, paper pulp, cardboard, plastic, glass, fiberglass, optical fibres, metal, earth, sand, polymer, cloth, plaster of Paris, etc. Resin is likely to react with a range of plastic products; so resin-made objects are to be kept very carefully as not to come in contact with plastic products. So, for storage purpose thick paper cover or cardboard case are safe. For further safety, these resin objects can be painted on the surface of contact. Plaster of Paris is often used to make models, especially in case of thick, solid looking objects. This plaster is very comfortable to work with but due to its fragile nature these models are handled carefully. Another problem of these objects is heavy weight. Paper, cloth and paper pulp models are very often found in toy and dolls museums. These objects are to be kept away from insect pests. Glass models are very beautiful to look at but should be handled with care. Fiberglass models have become popular in almost all types of museums due to their realistic features and durability .Plastic models cover a considerable portions of various models displayed in a museum. However, in dolls and toy museums, children's museums, science and technology museums, air force museums, navy museums, etc. these models are found very often. These products are light in weight and can be shaped and coloured very easily. Again these are less vulnerable and can be easily cleaned up. Wooden models are also found in museums. But, with the passing time and present condition of scarcity of forests, it is advisable not to use wooden models in museum purpose to save the greenery for survival of life in the earth. Metal models (Copper, brass, nickel silver, aluminium, steel, iron etc.) are found particularly in science and technology museums. Ship and train models etc. are prepared from cast metals. Lead and zinc contents of metal models are sometimes corroded with exposure to oxygen and moisture present in the environment. These models are to be kept properly with silica gel. Some metals are harmful to human health, so these should be handled with proper guidelines. Gloves should be used. For binding and fixing the components of different sizes and shapes various adhesives, corners, screws, hinges, tapes, threads, welding, etc. are required. Adhesives must be handled with adequate care and precaution so that it cannot get in touch with skin and eyes. Similarly, shaping, sizing, cutting, stitching, screwing of component parts must be done with concentration.

Scale of the models, whether minimized or maximized, must be maintained strictly otherwise the exact view of the model will be hampered. Three-dimensional graphic chalk outs or photographs from different angles help in this procedure. It is better to consider the final placement of the model as to ponder over the distance from the viewer's eyes and angle of view. If more than one related models are to be displayed in a gallery, their comparative sizes and scales are to be maintained. If possible, a note on the label may be given on the scale of the model. Correct display makes the model more meaningful. Proper planning and preparation is required in this case. Photography of popular and significant models can be used in museum publications. Models sometimes become the topic of temporary exhibitions. Restorations of old or damaged models are to be done properly. Steps to be taken as per guidelines so that further deterioration can be prevented. Mechanical, chemical and biological deterioration should be minimized as far as possible. All damaged parts must be repaired or replaced in time to avoid greater damages. Old models, if possible, can be painted to give a new look. Exclusive models become real assets of the museums.

THE CONCEPT OF PEACE MUSEUM

Subhasri Sen

"Since wars began in the minds of men, it is in the minds of men that the defences of peace must be constructed"—UNESCO Constitutional Principle.

The century just passed was marked by unexpected violence and cruelty. The most of the nations suffered or contributed to war, destruction and genocide. The two World Wars occurred resulting in enormous loss of life. Untold numbers were sacrificed at the alter of ideology, religion or ethnicity.

Scientific and technological advances occurring in this unusually blessed century portend a great surge forward in social evolution of the planet and indicate the means by which the practical problems of humanity may be solved. But it could not solve the problem of crime and violence in society instead enhancing the possibility of war with much more technically advanced weapons of mass destruction.

The increasing level of violence in our daily lives inspired the man to study intensely the process of peace. Nevertheless, the basic need for peace in society is to grow awareness about the cause and effect of violence in society, and to inspire a new understanding that peace begins with oneself and in one's own community.

· Peace is a common desire of humanity .It is considered as a set of values, attitudes and modes of behaviours promoting peaceful settlement of conflict and quest for mutua understanding. In fact peace means, in one sense, a way to live together.

Museums,.already proved itself as a "non-profit making permanent institution in service of society" and to encourage the behaviours and attitudes of the people necessary to strengthen peace and democracy. "Peace" is becoming a central theme in the programming of many museums. But there has been developed a special type of museums since 1900s, though comparatively less in numbers, called peace museum. It is playing a major role that promote public awareness regarding justice, equality , peace and good governance.

Concept of peace museum is comparatively modern in the museum history. The origin of peace museum tradition and its creation lies in the collective activities of several individuals and institutions. The Hague Peace Palace, founded by Andrew Carnegie in the early 1900s was probably the first museum envisaged as a "Museum of Peace". It projects peace through international law. But the earliest peace museum conveying actively anti-war message were the Jean de Bloch's International Museum of War and Peace, established in 1902 in Lucerne Switzerland and Ernst Friedrich's famous anti-war museum (1940). But these museums were destroyed, by the war which they sought to prevent. The same concept of anti-war message is kept alive by the museums established much later in the 20th century viz. Berlin's Anti

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war Museum and Peace Library and Anti-war Museum of the German Evengelical Church, both established in early 1980s. The Caen Memorial Museum, France and the World Centre for Peace, Freedom and Human Rights at Vardun, Bulgaria established in 1988 and 1983 respectively. It may also be noted that the Lindau Peace Museum, Germany, established in 1980 depicts the tragedy of war.

Earlier peace museums primarily depicted the horrors of war. Modem peace museums now attempt to represent more positive and constructive approaches to peace. There are museums that are dedicated to peace education through visual arts, viz., Chicago Peace Museum, 1981. Peace Museums conveying issues of regional peace and peace within the people will be found in Germany's Meeder Peace Museum and Yi Jun Peace Museum of Holland. Museums dealing with nuclear war, such as Peace Memorial Museums of Hiroshima and Nagasaki, Japan established in middle of the 1950s and Japan's Nagasaki Atomic Bomb Museum, opened in 1996, fall under the category of issue-based museums dealing with the catastrophe of nuclear war.

There are museums , which focus on humanitarian action such as the Florence Nightingale Museum in London and International Red Cross Museum in Geneva. There are a set of museums which may be defined as the museum of non-violence, such as the Gandhi Museums in India and similar entities in Europe, Australia and the USA. The history of Noble Peace Laureates is preserved in Noble Peace Centre, Oslo.

Europe is considerd as the birthplace of peace museum. But in history of civilization, all forms of religion use the power of prayer for human prosperity and peace. Ancient temples, churches, mosques, monasteries, which are considered as the earlier museum like institutions, contributed in spreading peace and harmony. The principles of the Buddhism and Jainism are essentially key factor to eliminate the culture of war, violence and terrorism. The Vedic prayer reflects peace and fearlessness and bring happiness.

Modern peace museums throughout the world are very much active in fulfilling their responsibility, to explore creative, non-violent solutions to social issues through education, community involvement and exhibition depicting local, national and international effort to attain peace.

The various activities of museums involve—

- Peace Education—
  - i) School Education
  - ii) Community Education
  - iii) Publications of books, teaching materials etc.
- Raising citizens—mass awareness of various issues
- Spreading ideas of non-violence
- Promoting international understanding
- Encouraging people to work for peace more actively
- Preserving war remains.

Peace museum catch interest of public through their indoor and outreach activities. The process may include—

- School visit or School loan kit

- New temporary exhibition regularly and renew permanent exhibion
- Peace concert, Peace exhibition and peace film festivals etc.
- Publication of news letter, book etc.
- Lecture, seminars about culture of peace
- Sales counter—selling replica, model, cards, photos regarding peace
- Creation of websites—to reach to a large group of people with their aim.

Exhibits of the peace museum may feature war, social change, refugee, civil rights, life and work of some personality contributed to peace etc. Nowadays, the themes of the peace museums are presented using the most advanced explanatory communication techniques. Audio-visual media and interactive multimedia systems allow the visitors to travel through the most relevant events while touch screens may help them to establish a dialogue process pertaining to the event of interest to a visitor. The translation of languages ,in many peace museums, are available through the means of acoustic guides. Sensory exhibits produced through photographic murals, video walls, symbolic objects and appropriate proportion of colour schemes help the visitors to sense the difference between oppression, violence, the search for peace and the benefits that the peace bring. Conferences, presentations and educational and transmissional activities of the museum using audio-visual aids help to make the whole thing very much interesting. Serious internet and television programmes, as well as publication of scholarly magazines, journals, electronic journals are often arranged by the peace museums to generate impetus in promoting peace research. Empowerment of electronic media to create peace programmes and film help the museums to reach to a vast number of public with their moto. In addition, sometimes lives of important personality who have advanced the cause and culture of peace extensively researched and presented as models to wide public. Exciting books, cassettes and videos often produced by these museums presenting various themes and aspects of peace. Many peace museums also hold an annual award ceremony to recognize individual who have contributed in revolutionary ways to the process of peace. However, the use of exhibits, audio-visual media and the activities demanding the monitory contribution are planned depending on the financial condition and the necessity of the peace museum. In the whole process, like all the museums, requirement of experienced, prudent and expert museum personnel is the main necessary criteria.

The process of spreading peace in society is not at all the same for every peace museums. It varies according to locality, historical background of the country, current affairs of the region, moreover the types of visitors visited the museum and their demand and interest. However, the purpose remain the same – peace is the ultimate goal.

Peace Museum will help to build a culture of peace whose aim is to create peaceful norms of the society by countering increasing violence of modem life. Working in co-operation with peace organizations the peace museums can help to inspire and motivate people of all ages to work for peace.

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THE SUN TEMPLE KONARSK– ITS DETERIORATION AND RESTORATION

Anindita Kundu (Saha)

The Sun Temple at Konark is the crowning piece of Orissan architecture and sculptures. built in the 13th century A.D. during the reing of king Narasimha I (1238-1264 A.D) of the Eastern Ganga Dynasty, is a poety in stone and a world heritage monument. Archored to the sands at Konark beach, the temple stands hoist upon its enormous 24 intricately carved wheels. The temple, conceived as a chariot hauling the Sun god (surya), across the heavens by the mighty of seven splendid caryed horses caught in the mute symphony of stone, lies in partial ruin. The Mukhashala, or entrance hall continues to interest both devotes and visitors. The walls of this magnificiant ruin have exquisite sculptures covering many aspects of life : scenes of love and war, trade and court transactions, hunting, catching of elephants, teaching of sages, amorous dall-iances, and mythical figures all vie for attention on the panels and niches of this immortal work of art. Mighty Sinha-gajas welcome the visitor at the porches.

Everyday the Sun god rises from the lap of the blue ocean close by and casts. His first gentle rays on the sanctum, sanctorum and then circles the temple during the courses of the day, illuminating the three magnificent images of the morning sun, the mid-day sun and the setting sun.

This gorgeously sculptured and intricately covered temple was once the Black Pagoda to martime visitors to Orissa in ancient time.

Konark is a many splendoured gem of Orissan Art. It's beauty is not for description in words. It is to be sun, enjoyed and savoured, not once but again and again, for it is truly a thing of beauty, a joy forever.

The Sun Temple at Konark is made of Khondalite Stone.

Nature of Khondalite Stone :

The Khondalite Stone is a metamorphic sedimentary rock, have different textural and structural features and having different shades of brown and greyish colour have been used in the temple. The Khondalite is very distinctly banded and the individual bands are different in appearance and mineralogical composition. The main constitutents of Khondalite are quartz, acid felspar, garnet, sillimanite and occasionally small quantities of graphite and other minerals as well. The porosite of stone varies from 7.8 to 12.4%. The stone is highly susceptable to weathering. Under the natural conditions the end product of the weathering of the Khondalite is either Kaolin with quartz and ferric hydroxide or in a more advanced stage, a lateritic material containing mainly the hydroxides of iron and aluminium.

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The Causes of deterioration of the sun temple :

1. Climatic Factors :

i) The Sun Temple is situated near the Konark Sea Beach. So the violent fluctuation of R.H. and temperature cause physical weathering of Khondalite Stone used in Sun Temple due to the expansion and contraction of stone surface. As a result of physical weathering hair like fissures appear on the stone surface.

ii) The Khondalite stone used in the Sun temple is very porous and hygroscopic. As the temple is situated near the Sea shore, the stone picks up large amount of sea salt mainly sodium chloride directly from the air as well as in the soluble form during the rainy season. This sea salt is by for the most significant in context of stone decay. The salts already present in the porous surface of stone absorb moisture from air as the relative humidity of air near the sea shore is high. Crystalization of these soluble salts due to fluctuation of temperature causes pulverization of Khondalite Stone.

iii) In the Sun temple iron clamps are used during the repairing of displaced stone. Rusting of these iron clamps occur due to the see page of rain water through cracks and fissure appear as a result of physical weathering and the action of soluble salts. Rusting of iron dowels cause volumentric increase that produces stress on the stone, is responsible for cracking, flacking and staining of stone surface. The stones become brittle and get chipped off and chunk of stones come out.

iv) The stones loss their inherent capacity due to the action of soluble salts. As a results chunks of stones come out.

v) As the temple is situated near the sea beach, the sand laden air from the sea towards the land blusting on the stone surface causes attrition and abrasion of stone surface.

2. Geological Factors :

The rain fall at Konark is quite considerable for 4-5 months of the year; for the remaining months the rainfall is low. The average maximum and minimum yearly temperatures are about 30°C and 24°C respectively with an amplitude of variation of 8°C to 11°C. These conditions are thus favourable for chemical weathering of stones due to the kaolinization of the feldspars and limonization of the garnets.

The over all result of this chemical weathering is the laterization of the Khondalite. The stone has acquired a mottled appearance due to the accumulation of kaolin and limonite. silica and quartz have been left behind more or less unaltered.

3. Biological Factors :

i) The climatic condition prevailing at Konark is favourable for the cryptogamic growth. Moss and lichens affect the stone widely. The acids generated by them attack silica of Khondalite and cause etching damage on the stone surface.

ii) Some trees like *Ficus bengalensis, Ficus religious* etc grow on the the surface of the stone and their roots are penetrated through the cracks and fissures. They seek moisture from the mortar which is then become loosen and chunks of stones come out. Besides, the secretion of Banyan trees stain the surface of the stone.

iii) The lichen and moss make dark colour stain on the stone surface. The algael growth also found on the stone surface. At first it gives dark green appearance. But after drying it gives brown appearance and produce dirty appearance on the stone surface. This condition is suitable for the growth of the rooted trees.

iv) Disintegration of the stone of Sun Temple is cause by accumulation of guano and nesting matrials of birds. These can form a compost, which break down as a result of bacterial action and release acids which attack the stone surface. The compost also contain salts (specially nitrate) which might cause crystalisation damage on the stone.

4. Man Mada Factors :

i) Human vandalism like writing on the stone surface, rubbing cloth, hands against the stone surface cause structural damage and also attrition of the surface of the temple.

ii) As the Sun Temple is the place of tourist interest, large number of people visit this place through out the year. Hard grit embedded in shoe, boot, heel of visitors cause attrition on the floor of the Temple.

iii) Air Pollution :

Now there is a tremendous growth of population around the temple at Konark and the temple have become the area of commercial interest. The main causes of air pollution around the temple are :

* Everyday a large number of tourists visit the temple. They use various automebile to reach this place. These automobiles release harmful gases like sulpher dioxide, carbondioxide, carbon monoxide etc.

The sulpher based acid attacks the iron compound of Khondalite stone and temporarily converts it to a soluble form. As the Khondalite is quartz based sand stone, it is very resistant to the sulphur based acid, but it can become very dirty in the main washed area of the temple.

** There is a Pipli village at near by Konark famous for applic work and an important market for export. Besides, there is some small scale industries. These are also responsible for the emission of harmful gases which cause damage of stone.

iv) Now there is agricultural field specially paddy fields arround the temple. Paddy fields require constant standing of water level for few months. Water seepage occurs, from the paddy fields to the structure of temple by capillary action, This effect of capillary absorption can extend several meters above the level of damp soil and provoke chemical and static damage of the temple and also subjecting it to overload. This overlodding cause structural damage to the temple.

v) Destruction of magnetic field by breaking the high power magnet at the top and the bottom of the temple in the past also cause structural damage of the temple.

Steps Taken to save the Temple :

The temple is built of a highly ferriginious Khondalite stone which is a garnet-i-ferrous sillimanite schist. This stone is not durable and weathering quickly in the polluted atmosphere. After the weathering action the streaks of red and brown with buff ground mass, have disfigured the whole structure and the sharp edges have turned into round. The greenish colour imparted by the ferrous iron has turned into reddish patchy by ferric iron on account of oxidation. Minor vegetation have grown up and there were stagnant of heaps of mass of sand and other materials carried by sea water and wind. The attrition and abration effect was also noticed.

The platform of the temple was found in deteriorating condition due to the action of water containing soluble salts.

The techniques involved in technical conservation are as follows—

A. Structural Conservation :

1. Resetting the old stones, out stones and platform of the temple :

The old stones which had come out were resettled by using good quality water proof mortar (Polymer modified cement).

The platform of the temple was reset in lime mortar after proper grouting with water proofing compound. This work was carried out by driliing hundreds of holes into the platform around the temple and the use of grout of liquid cement, sand and water proofing inert material called ironite. Reversing the slop to a width of 6 metres on the outskirts of the temple compound wall was done by removing the heap of sand stone.

2. Renewing the missing and worn out stone :

The missing and worn out stones were renewed by using homogeneous quality of Khondalite stone and water proof mortar.

3. Replacing the deteriorated portion of stone :

The plain and molded blocks of stones, masonary which had suffered physical disintegration and chemical weathering were replaced over the eastern and southern gate was by good quality homogeneous stone while retaining their architectural originality as per as follows. Only the stones with floral motifes were replaced. Good quality mortar (Polymer medified cement) was used for the replacement of stones. The Vimana of the temple was restored.

4. Replacing old rusted iron dowels :

The iron dowels which were used for the repairing of displaced stone in the past had been replaced by rust resistant copper dowels.

5. Changing the slope of floor of the Temple and stone pitching :

Reversing the slope to a width of 6 metres on the outskirts of the temple compound wall was done by removing the heaps of sand stone. The sand beyond this was stabilized by stone pitching.

6. Strengthening the temple foundation :

The temple foundation was strengthened by grouting using the water proof Polymer medified cement for which a series of holes were dirlled at a regular intervals and grouted after exposing the burried plinth down the depth of the water level.

B. Chemical Conservation :

Chemical conservation is a follow up of the structural conservation. The chemical conservative mesures were under taken in the following steps :

1. Chemical Cleaning :

Dust, dirt and stains were removed from the surface of the stone by brushing and using 5% ammonia solution. The dust and dirt inside the ornamental pattern were mechanically picked up.

After that the remaining dust and dirt was removed with teepol, nonionic detergent and then thorough washing ensuring that no traces of chemicals remain over the surface.

2. Desalination :

Desalination of the affected area was carried out over a period of four weeks using poultices composed of paper pulp and deionised water. Soon after its applications, the poultices was covered with a thin plastic film to prevent water evaporation and was left on the surface for a period of 12 hours. After that period, the film was removed and the pad was allowed to dry completely. The process was carried out till the chloride test of the solution obtained by extracting the salts from subsequent poultices with deionised water was negative.

3. Fungicidal treatment of cleaned surface :

Due to coastal area, the monument experienced heavy rain fall and the structured may get coated with growth of mass and lichen of various stain as the cleaned surface would be exposed to the environment. So, after cleaning by the above method, a fungicide is necessary to prevent further growth comparing different fungiodes, it had been observed that 2%. Zinc sellico fluoride is the best for the temple stone.

4. Application of preventive :

Application of preventive is one of the most important step in chemical conservation. As such, there is no perfect preservative or consolidant for stone surface for long effectiveness. In view of its suitability to the particular stone, climatic conditions, cost and availability, the polymethylmethacrylate is the best for the monument. With the recommundation of the expert committee (2%) polymethyl methacrylate in toluene was used to slow down the weathering of exposed stone surface.

Besides, other preventive measures taken to save the temple were extensive plantation to form screens was made by growing cashew-net trees to protect the temple from sand blasting.

Remarks :

The cyclon in 1999, October could not damage the temple. But the trees planted around the temple were uprooted. Now a ramput has been built surrounding the temple. Sand bearing wind is registered by this wall.

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RESTORATION WORK AT SUN TEMPLE, KONARK

ECOMUSEUMS : A PLACE FOR ESTABLISHING LOCAL IDENTITY

Alokananda Pal

The word museum is derived from the name of the ancient Greek goddess *Muse*, which originated from the Greek word *Mousa* or *Moisa*, related to Greek mythology and religion. She is one of the nine daughters of *Zeus* and *Mnemosyne* and is the inspiring spirit of poetry. The other daughters are :

Calliope (epic poetry),
Clio (of history),
Euterpe (music and lyric poetry),
Melpomene (tragedy),
Polyhymnia (sacred lyrics),
Terpsichore (dancing),
Thalia (comedy),
Urani (astronomy).

Museum originally denoted a temple or a home of the *Muses*. It also meant a place of study. To the ancient Greeks, it was a philosophical temple connected with the goddesses– they called it *Mouseion*. To the Romans it was a place where they discussed philosophy. It was during the 15th century that museum came to be known as a place of collection with the connotation of encyclopedic wisdom. Only from the 18th century onward the word museum signified a building for the storage of historic and natural objects. Later on the International Council of Museums (ICOM), defined museum as – *a non-profit making, permanent institution in the service of society and of its development, and open to the public, which acquires, conserves, researches, communicates and exhibits, for purposes of study, education and enjoyment, material evidence of people and their environment.*"

(**ICOM Statutes**, adopted by the 16th General Assembly of ICOM, The Hague, 5 September 1989 and amended by the 20th General Assembly of ICOM, Barcelona, Spain, 6 July 2001).

In the last General Assembly, held at Seoul in 2004, ICOM contemplated including non-material evidence in the definition of museum.

Now with the change of time and social outlook, the conception of museum has a much broader perspective. It is no longer a repository of curious objects but also a house of wisdom that reaches out to the society to cater to its needs in various capacities.

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The main purpose of museums is to collect, conserve and interpret the heritage (cultural, natural and scientific) and to communicate the knowledge to the visitors. Therefore the policies and programmes were mainly object-oriented than socially oriented. As such the museums failed to relate themselves with the socio-economic development of the people, which they tend to serve. These object—oriented traditional type of museums were inadequate and unsuitable during the changes in the society. They dealt mostly with the past, ignoring the vital issues of the present, such as the ecological imbalance, problems of identity, social inequality, population–explosion, economic development etc., which were confronting the entire developing world.

During the 1960's some traditional museums began to modify the long-established philosophies and practices in order to relate to the societal needs, and different types of museums began to come up, often at a local level, in order to save fragments of *heritage* and to make a statement about local identity. A museum that demanded action by the community to conserve its own material culture and natural heritage within its geographical territory was one of the proposed new approaches which led to the formation of a museum, with its strong emphasis on community involvement.

Hugues de Varine who was Director of International Council of Museums for 10 years during 1964-1974 coined the word *ecomusee*. He invented the term in 1971 but the concept of ecomuseum was developed by his colleague Georges Henri Riviere (1897-1985) who was the founding father of the new ecomuseum movement. The term Ecomuseum was coined by Hugues de Varine at a lunch with one of the aides of the then Minister of Environment of France Robert Poujade at the ninth general Conference of ICOM in 1971, when the minister was to make a speech. The name *ecomuseum* is made up of two Greek words. *Oikos*, which means 'house' or 'entirety' and *museum*, which means a collection of things (from scientific interest or from the history of civilization). *The ecomuseum is an institution, which manages, studies and exploits – by scientific, educational and generally speaking cultural means the entire heritage of a given community, including the whole natural environment and cultural milieu. It is an instrument conceived, fashioned and operated jointly by a public authority and a local population. It is a mirror in which the local population views itself to discover its own image, in which it seeks an explanation of the territory to which it is attached and of the populations which have preceded it through generations.*

The main objectives of the ecomuseum are –

1. To interpret the area's historical, cultural and natural elements, their relationship and how it has developed the landscape.
2. To identify sites and create programs which would attract both the local/regional population and encourage tourism.
3 To create partnerships with the public and private sector.
4. Initiate activities that reflect the ecomuseum's mandate.
5. Inform visitors of the natural elements, landscape, architecture, lifestyles, industries and seasonal activities.

The ecomuseum aims at—

- Strengthening and improving the presentation of the region's culture and nature in order to provide the local people and the many guests to the area utilizing the history as a tool for understanding and influencing the present and future with the best possible experience.

- Making little known district accessible to tourists.
- Promoting research by means of study at all academic level. They appeal to schools and educational institutions at all levels.
- Illustrating the connection between technology and individual, between nature and culture, between past and present.

Ecomuseum is a continuous process of evolution. where new features and improvement both long term and short term are introduced into the development programme. The significant change to ecomuseum has been brought about by realizing the fact that cultural assets can help to boost the local economy, and thereby help community development. The change in the nature of global communication, travel and leisure has indicated that the most remote community has the ability to profit from tourism. For this reason one of the principle objective of the ecomuseum is to promote tourism and help in local economic development. Tourism has two major variants—cultural tourism and ecotourism—being especially relevant to ecomuseum.

Ecomuseums are also concerned with collection management. The collection includes everything (like local flora, fauna, buildings, weather, topography, tools, songs, arts and crafts, local history, culture, cottage industries, agriculture, health and hygiene, childcare, social and family-welfare, co-operatives, mineral wealth, forestry, consumption of electricity etc.) of a particular area.

The ecomuseum functions by contributing to the study of the past and present population concerned and the environment and trains the researchers in this field. They act as a conservation centre, which helps to preserve and develop the natural and cultural heritage of the area, and involve the population in its work and study and protection and encourage them to have a clear view of their culture.

The concept of ecomuseum that originated in France in the early 1970's was a departure from the traditional concept of ecomuseum where collections are kept in a building waiting for experts to study and visitors to view. An ecomuseum is more than that, Community in itself is considered something to preserve, making everyone responsible for taking care of the cultural heritage. Today there are more than 300 ecomuseums in the world. Few examples of ecomuseum are as follows:

- Ecomusee d' Alsace, France.
- Ecomusee du Pays de Rennes, France.
- Ekomuseum Bergslagen, Sweden.
- Okomuseet Sohojlandet, Denmark.
- Kalyna Country Ecomuseum, Canada.
- Rural and Wine-Growing Ecomuseum of the Municipality of Cartaxo, Portugal.
- Avalon 2000 Ecomuseum, United Kingdom.
- Ironbridge Gorge Ecomuseum, United Kingdom.

Some of the alike institutions are—neighbourhood museum, community museum, integral museum, territory museum, living history museum and open-air museum. These museums lay emphasis on socialization of museums and on the role of museums on community development, consistent with its identity as reflected in its heritage. They deal with man and nature in close relationship. The interdependence in life is presented in these museums as a matter of faith and not fashion. Hence, these museums are basically "community-oriented", instead of "object-oriented".

Ecomuseum contributes to the local development. It also aims to build local awareness, appreciation and confidence in using heritage resources as a means for promoting a sense of local identity. Ecomuseum is also a mean to protect and maintain heritage considered as geological, biological, archaeological, cultural, historical and geographical values, which surrounds us. In the ecomuseum, the public is an 'active' partner in the preservation, maintenance and security of the heritage. It is important for people in researching their own history. Firstly this participation is essential for the region's history to be true to life, close to the people and useful for the regions present and future. Secondly compiling the history of a place requires the co-operation of its inhabitants.

Ecomuseums developed within the community, would include the local people in all their activities. From the initial research and documentation of the local culture, to organizing exhibition for people's awareness, suggesting the developmental points as per their socio-economic need and actively participating in making plans for development of their society.

- Ecomuseums organises lectures on issues concerning work spirit, democracy, co-determination and future matters.
- They organise exhibitions on all the inter relations of ecosystems—nature and human intervention in a particular territory, including wild, domesticated and urban ecosystems.
- Courses, trips, seminars, entrepreneurship and cultural history courses and expanded collaboration with all the players active in the area are a part of the museums work schedule.

The substance of the ecomuseums has varied from one place to another wherever they have sprung up in France, Canada, and other European countries, Latin America or even in the developing countries. These museums appear to be in pursuit of new values and new combinations of functions, which ought to belong to modem museum institutions. As in other third-world countries, in India new museums have more promising opportunities for mobilizing public interest and support.

New Museology is now a worldwide movement. Eco Museology being the beginning of New Museology Movement. We should not get confused by the word 'New' in New Museology. It is only to distinguish its recent introduction in the profession. What is 'New' Museology now will become contemporary Museology in the near future. New Museology acknowledges two-fold responsibilities of museums, firstly, to preserve the integrity of the object as an element of our heritage, and secondly, to contribute to the development of our society.

Ecomuseums are seen as the museums of the people (because they manage the museum), for the people (as specific target groups as primary users are identified) and by the people because the staff, which runs the museums, is not wholly outsiders but depend on volunteers and participants for honorary services.

We are charged with the responsibility of conserving our heritage with the purpose of "bringing people and their environment together" and this idea of establishing ecomuseum is to realize their purpose and to change the awareness and lifestyle of people towards the environment for a better future.

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CONSERVATION OF TRADITIONAL MEDICINE

Moumita Paul

Introduction

Preserving tribal wisdom is as much an issue of restoring respect for traditional ways as it is of creating financial incentives. Planet Earth has entered the time of prophecy—a time that tribal cultures around the world say....may be the end of "time" as we know it and probably all tribes around the world have indigenous medicinal prophecy within their community. As a result of a tremendous changes undergone in the medical sciences, the traditional methods of treatments of ailing people using indigenous medicinal plants and animals appear to have been outdated.

Traditional Systems of Medicine

In West Bengal Santal and Bhumij were known for their principle of treatment and using of herbs to alleviate various ailments. The *ojhas* of Lodha and Santal tribes preserve a treasure of medicinal uses of plants.

The state of Manipur in India had very interesting instances of using plants and animal products by the tribals.

The Amazon, besides being one of the largest oxygen sources of the Earth, is a Botanical emporium where we find countless medicinal plants that was being used by tribal communities of the Peruvian Amazon.

Traditional Chinese Medical system that originated in ancient China over 6000 years ago. In its original form it represents a true wisdom medicine and although there are many Chinese medicine practitioners who still practice according to these principles, there is an increasing tendency for it to be split into separate parts, so that some practitioners practice only acupuncture and others practice only herbal medicine and so forth. Sadly this process is causing it to lose its holistic Traditional Healing Heritage.

Graeco-Arabic medicine system also originated over 6000 years ago and traveled to India, where it became known as Ayurvedic medicine and in ancient Greece it became Graeco-Arabic Medicine. It spread from its original home into Europe and was its traditional medicine until about 150 years ago. It was also carried by Islam into Middle East and the Indian subcontinent, where it is known as Yunani Tibb or Unani Medicine. Many practitioners of Graeco Arabic Medicine still utilize the holistic principles of Traditional Healing.

Plethora of Tribal Wisdom

Thus, this largely undocumented knowledge base is humanity's lifeline to a time when people accepted nature's authority and learned through trial, error and observation. But the world's tribes are dying out or being absorbed into modern civilization. As they vanish, so does their irreplaceable knowledge.

The number of different tribes around the world makes it impossible to record or otherwise preserve more than a tiny percentage of the knowledge being lost. Since 1900, 90 of Brazil's 270 Indian tribes have completely disappeared. Researchers estimate that Africa alone has 1800 languages, Indonesia 672 and New Guinea 800. If a language disappears, traditional knowledge tends to vanish with it. The most immediate tragedy in the loss of knowledge and traditions is for the tribes themselves. The do not always die out, but the soul of their culture withers away.

In recent decade, Tibetans have returned to their traditional medicine, which they often find more effective and less harsh than Western drugs. Attitudes are beginning to change, however. Scientists are learning to look past the myth, superstition and ritual that often conceal the hard-won insights of indigenous peoples.

The Traditional Medicine Network of Australia was formed in 1998 to represent the interests of Traditional Healers. Its purpose is to forge link between Traditional Healers all over the world, irrespective of their ethnic background or medical traditions, to educate the public about Traditional Healing and to foster its practice in Australia as well internationally.

World Council of Elders is a global organization dedicated to support the educational, healing and unifying work of traditional indigenous Elders in every country at this critical time in human history.

Dr. Terry Maresca, a Mohawk Indian who trained in Western medicine at the Albert Einstein College of Medicine in New York, represents a new kind of Native American healer. During the gulf war, European doctors treated some wounds with a sugar paste that traces back to Egyptian battlefield medicine of 4,000 years ago.

In the Amazon Jungle there is a Shamanic tradition; but Shamans properly as such do not exist. American companies are also beginning to see economic value in indigenous knowledge. In 1989, a group of scientists formed Shaman Pharmaceuticals, a California company that aims to commercialize the pharmaceutical uses of plants. Among its projects is the development of a antiviral agent for respiratory diseases and herpes infections that is used by traditional healer in Latin America.

The traditional anti-diabetic medicine used for generations by the Kaani Tribals in South Kerala is going to create history of sorts as the national patent office in New Delhi is going to formally grant it India's first patent for a tribal medicine.

Conclusion

If the developed world is to help indigenous peoples to preserve their heritage, it must first recognize that this wisdom has value. Moreover, preservation of traditional wisdom has become a subject of paramount importance for the protection of Intellectual Property Rights. After all the collective wisdom, kept alive by a particular ethnic group, for thousands of years should not be subjected to monetary profiteering by some unscrupulous traders. Museums may play crucial roles in this context through :

- Documentation
- Organizing exhibitions highlighting the different aspects of traditional medicine
- Facilitating in obtaining patents etc.

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MUSEUM EDUCATION—THE RECENT THOUGHTS

Piyasi Bharasa *

Museums and galleries are becoming more professional and one of the areas in which this is most noticeable is the area that we might loosely term "Museum Education". The professionalization of Museum Education demands that we should define what we mean by the expression and secondly having defined it, we need to establish the means to deliver it.

A massive change is taking place in the way that museums are to be understood. This change provides a climate for museum education that could be more positive than anything we have seen till now. Museum can be phenomenally successful in terms of increasing motivation to learn in enabling people to discover and develop new ideas, which are meaningful and alive.

The idea of Museum Education can be discussed on the following sub-themes.

A) MUSEUM EDUCATION THROUGH MASS COMMUNICATION AND INTER-PERSONAL COMMUNICATION IN MUSEUM.

i. The building of effective, economical exhibits through research into an audience's interaction with the Museum, and in particular with its exhibits.

ii. The establishment and continual refinement of standards that define effective museum exhibits.

iii. The building of a better relationship between a museum and its communities. particularly communities not traditionally represented in museum audiences, by informing exhibit development with knowledge gained through community consultation, gained through community.

iv. The dissemination of knowledge gained through audience research to all museum staff and the wider museum community.

B) THE CLASSROOM CONNECTION: MUSEUM AS A CATALYST FOR SCHOOL REFORM

A growing recognition that they are part of a larger educational, social and cultural fabric has prompted many museum to support literacy among their audiences both within the walls of their institutions and out in their communities. Museums have recognized the tremendous content they hold in their collection that can interest and motivate adults and children in catering the formal education.

Under this sub-theme museum educators who are engaged in school reform efforts discuss new alliances between museum and schools from a variety of perspectives such as

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*- Research Scholar.

i. Museum schools
ii. Object based Learning
iii. Teacher enhancement
iv. Technology and systemic reform
v. Teacher training workshops
vi. Curriculum resource packets
vii. Gallery information sheets

C) MUSEUM EDUCATION THROUGH COMMUNITY PROGRAMMES

The programmes of events and activities of a museum are formed in the context of the Museum's mission and by efforts of the museum staff and of course the relevance to the museum's mission.

Following events many be organized :

i. Slide lectures on the theme of 'Art, History and Literature' or 'Heritage Studies' or 'Natural History Paintings'
ii. Artist-led workshops on the theme of any relevant topics such as The Bengal School of Painting', Pata Chitra—The languishing Art of Bengal.
iii. Group discussion or panel discussion at community centers, colleges and public libraries.
iv. Museum camps to explore the Museum galleries through special visits by school children studying at class V-XII.

D) MUSEUM EDUCATION THROUGH OUTRENCH PROGRAMMES INVOLVING SCHOOL CHILDREN

Museum is the source of the message or transmitter of information and education. Sometimes museum acts as the medium through which the intended message is transmitted. It is the favourable circumstances like helpful environment and freedom from extraneous interference. Museum plays an important role in education organizing following outreach activities :

i. Toyland with fabricated art–objects and replicas.
ii. Potential development of rural children organizing Art – Workshops, Quiz Contest and Sit & Draw competition.
iii. Story – telling session on the theme of the artifacts displayed in the museum galleries.
iv. Evolutionary models and pictures.
v. Organizing debates on the theme of Nature and science round about us.
vi. Discussion on children health and nutrition.
vii. Wax models of popular art objects from museum's collection.
viii. A nature corner where a special show will be organized on endangered animals of India
ix. Quiz contest on 'Indian Art, History Heritage and Culture.'
x. Film show on 'The Heritage Mosques and Churches of Calcutta'.

E) MUSEUM EDUCATION THROUGH AUDIENCE RESEARCH PROGRAMME.

The following points may be considered under this particular sub theme.

- i. The building of effective, economical exhibits through research into an audiences interaction with the museum in general and exhibits in particular.
- ii. The establishment and continual refinement of standards to define effective museum exhibits.
- iii. The building of a better relationship between a museum and its communities, particularly communities not traditionally represented in museum audiences by informing exhibit development with the knowledge gained through community consultation.
- iv. The dissemination of knowledge gained through audience research to all museum staff and the wider museum community.

F) THE ROLE OF FOLKLORIC MODELS OF MUSEUM INTERPRETATION

This particular sub theme may explore the interrelationship of folklore and education and discuss how museum educators use the disciplinary approach of folklore in their work. Folklorists study the vernacular and expressive culture of ordinary people learning, doing, behaving and expressing themselves in their social world. The unique perspective of folklorists is used in developing exhibitions in educational programming and in developing relationship with the diverse communities museum seek to engage. This issue offers concrete models and case studies that demonstrate the relationship between folkloric theory and practice in museum education.

Museums collect and display objects for a larger and publicity beneficial purpose to share the knowledge with a community's school, hospitals, churches, symphony or orchestras and other academic institutions. The purpose of museum generally and independently in particular is not synonymous with education, knowledge, leisure or entertainment. It is a combination of those elements in which a common aim is selective communication of information and experiences. Museum education is concerned with the museums capacity to respond independently to the forces of change influencing them over the next decade. Response means management decision and action on a stand-alone basis and in collaboration with others.

The museums should take every opportunity to develop its role as an educational resource used by all section of the population or specialized group that the museum is intended to serve. Where appropriate in relation to the museum's programme and responsibilities specialist staff with training skills in museum education are likely to be required for this purpose.

Therefore, the museum has an important responsibility to attract new and wider audiences within all levels of community, locality or group that the museum aims to serve, should offer both the general community and specific individuals and groups within it opportunities to become actively involved in the museum and to support its aims and policies.

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SOME POPULAR ANIMAL MOTIFS IN EARLY BUDDHIST ART

Saktirani Chakraborty

Early Buddhist art is decorative in character, Animal occupies an important position in plastic and pictoral representation. Animal figures, *viz.* elephants, snakes, bulls, horses, lions and birds are found, carved or printed, in the entwined motifs of the floral designs for enriching the total form. Some times in an individual unit and some times these turned into ornamental resumes as an integral part of the whole design. Animal motifs are usually based on a religious theme. There are also secular motifs.[1]

Symbol of Elephant

There are two parallel developments, *viz.* (a) The war-God Indra becomes the God of rain; (b) The Goddess *Gaja-Laksmi* appeared in the Indian pantheon.

Indra with his elephant (attached) represents Indian philosophy of life of the Early Aryans and *Gaja-Laksmi* represents Indian pantheon. The Harappan influence, is traced in different streams, e.g. (i) elephant is the God of agriculture; (ii) agriculture is the gift of the Mother Goddess. The history of evolution of Ganesha, who is called composite God. Against this background Ganesh is an admixture of Aryan and non-Aryan beliefs.[2]

The *Gaja-Laksmi* symbol carved in the Early Buddhist monuments implies the nativity of Buddha. His birth is always considered to be an auspicious event in the history of Buddhism.

The *Naga* appears in the Satapatha Brahmana[3] representing a huge snake or a huge elephant. Their association with water and rain together with the sexual approach has been transferred to the elephant (the *Naga*).[4] The most popular belief, indicating the sign of conception in womanhood by the visit of a snake in her dream (not only in India, but also in different parts of the world with slight variations), has been directly transferred to the elephant. Thus, in the Buddhist legend, it is found that the Future Buddha has left Tusita Heaven and conceived in the womb of mother Maya or Mahamaya in her dream as a white elephant who descends to the Earth. It ultimately becomes the symbol of Buddha.[5]

Many of the coins of the king of Kausambi, Ayodhya and Ujjaini and also some of the rulers of North India, belonging to the 2nd century BC and onwards, represent the figure of *Gaja-Laksmi*, i.e. *Sri* or *Laksmi* taking birth assisted by the elephant.[6] Further, in all Buddhist monuments (Bharhut, Bodh-Gaya, and Sanchi, etc.), the figures have been depicted as favourite motifs for the artists.

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The stone relief of a female standing on an elephant and embracing a flowering tree, executed on a railing of the Bharhut Stupa proved that this idea has been transmitted to the religious beliefs of the common people. The embracing trunk of the elephant, round the stem of the tree symbolises the sprinkling the supply of the vital role of life. All carvings are probably executed between 1st Century BC and 1st Century AD.[7]

Thus the elephant, which symbolises the life giving force of nature and thereby associated with mother Goddess which is considered as the source of life. The lotus stalks found in Bharhut to be emerging out of the mouths of sitting elephants and in variations in the representations of the motifs could be traced in Sanchi, Amaravati and others. The elephant is replaced by the *makara* and *kumbhanda* (*Yaksa*)[8] whose mouth and navel represent such outlets. These are logiclly changed for both the *makara* and elephant symbolise the life-giving force of water.

The elephant has been depicted in the Buddhist monuments at Bharhut, Bodhgaya, Amaravati, Sanchi, Nagarjun Konda, in Ajanta paintings and the like.

Symbol of Snake

From the earliest time to the all periods of Indian history, it can be traced that *Naga* Worship is the vital factor, in connection between water and *Naga* (Snake).[9]

The snake as the symbol of fertility of the vegetable world, which is the sign of faculty of womanhood.[10] *Naga*, which is widely worshipped by the folk as a tutetary deity.[11]

We notice the wide influence/use of *Naga* in Buddhist religious beliefs and practices, as a number of stories in the Jatakas and other Buddhist texts where Buddha personally, or his disciples are described some powerful *Naga*, demons *viz. Apata* the *Naga* of the Mango-Ferry and *Naga* of Uruvita, etc. At the advent of Buddhism, *Naga* has been worshipped as a tutetary Gods and later has been accepted as the devout worshippers of Buddha, who is identified as Supreme Being. In some other Buddhist legends, we find Nanda and Upananda, the two *Nagarajas*, bathed the infant Buddha just after his birth. The serpent kings – Varuna, Manasvin, Sagaga, Anavatapta, Nanda and Upananda, etc. are associated at the time of *Mahaniśkramana* (the great renunciation).[12]

Another legend of *Mucalinda*,[13] the *Nagaraja* has shettered Buddha during seven days against rains and winds by spreading his snakehood like a canopy over the Master's head. Further, in the *Megha Sutra*,[14] it is stated that Buddha spells to the *Nagas*. Such stories were fabricated to establish the superiority of Buddhism over the *Naga* cult. The higher religious orders, namely, Vaisnavism, Saivism and Jainism also have considered *Naga* as a popular cult, which has been widely spread over India. The *Naga* elements estabilsh creeds to their respective religions.

Symbol of Bull

The ideas of divine origins of Kingship has been developed. The term *Vrksa* is applied to qualify the chief among kings, i.e. *Raja Cakravarti*. The Lord of Earth or *Prthivi* implies for which Cow is a common synonym.[15]

In process of evolution the implication of the term *Vrksa* has been elevated to a much higher level. In a symbol of self-control and resolution as well as sexual fertility or corporal strength. It has been applied to the saviours like the Lord Buddha as Sakyapungave as his special *lanchhana* or cognizance. This symbol in Buddhism which has been adopted to be transformed the character of the ascetic religions.

Bull is dominant sign which stands for Buddha's human birth as the traditional date of birth of the Master is the full moon of the month of Vaisakha under the Zodiacal sign of Taurus.[16]

Symbol of Lion

In the Bharhut Stupa, the figures of the Goddess *Chulakoka* (*Ksudrakoka*), *Madhyamakoka* and *Mahakoka* carved on the railing which belong to the *Kokamukha* group of Goddess which has been depicted in their fine anthropomorphic forms. It sets the same reverse track that when Trantricism arrested progressive movement of the religious throught of India. The composite conception of the mother Goddess like *Narasimhi* (lion faced Godde s), *Vagatamukhi* (cat-faced Goddess, identical of Egypt) and *Barahi* (bearfaced Goddess) of Hinduism, and *Simhasya* (lion-faced Goddess). *Svanasya* (dog-faced Goddess) or tantric Buddhism appeared to prove the inherent fear of the impersonal Female–principle latent in the human psyche.[17]

The Buddhism further transformed it as "the power" of the seeker of liberation from all bounds of nature according to Buddhism is the primary cause of all causal nexus, *Pratiyasamutpada*. Thus Buddha has been described in the Buddhism as *Sakyasimha*, i.e. the Lion of the *Sakyas*. The twofold implication is in the lions of the Asokan Pillar, facing four quarters carrying *Dhammachakka*. On the one hand, they represent the Buddha who sets in the motion of the wheel of law or *Dharmachakra* to deliver mankind from the sorrows of *Samsara* and on the other, they stand as the royal symbol of Asoka, who had dedicated his life to propagate the gospel of Buddha to the world at large.

In the later period a rampart lion on a female figure symbolising a *Yogi* fighting for the liberation from the bonds of nature which is involved in contact with Buddhism. The orginal implication on the animal indicating its association with the great-mother, has been established Brahmanical Goddess, like Durga, Sakti, Uma and the like. They are retained throughout in the later period of Indian religion. In the Mahajana Buddhism the symbol was borrowed. The *Vahana* of *Simhanada Avalokitesvara* and other *Bodhisattavas* characterised the feminine predominane leading to the association of the animal with the Buddhist tantric goddess on its development.[18]

The Symbol of Horse

Hayasya, the Buddhist tantric goddess undoubtly represents her fusion with a pair i.e. the female herbivore of species, without altering our conviction.

The implication of the horse has been conceived in a different light in Buddhism. The prince Sidhartha, the Future Buddha left home on horseback (*Kanthaka*). The horse stands in Buddhism for the symbol of remunication.

At the time of great renunciation, two were present, his faithful charioteer (*Chandaka*) and his horse (*Kanthaka*), when *Kanthaka* realised that his Master went for ever, he would newer see his master again, his heartburst and he die. He was reborn in the Heaven as the thirty-three Gods — *Kanthaka*. The symbol of horse is appeared as bodily vehicle and the rider is the spirit. Bodhisatta's renunciation is like that of any other *Sannyasi*, virtually a death.[19]

The horse has been defined as men's steed, worns for man and engery is, even measured in the term Horse Power. The horse signifies a quantum of energy at man's disposal.

Studies made so far reveal that the living carnivores. irrespective of their sex, to be associated with the female principal. The male herbivorous animals associated with the male anthropomorphic gods as their symbols. The carnivore, which is represented the male God had either in its zoomorphic form or a composite form.

But on the contrary, it would be seen that a herbivore stands for a female deity and always represents her in its female form. The anthropomorphic form of the animale (elephant, horse, etc.) have been incroporated in the body of a female *Kinnaras*, female centaurs or *Gandharvas*, who have a equine head on a human body or vice-versa, and *Hayasya*, the Buddhist horse-faced tantric Goddess.

In case of illustration, we may frequently use the motif of worshipping the *Bodhi* tree of different Buddhas, i.e. *Patali* of Viparin, *Sale* of Visvabhu, *Sirisa* of Krikuchanda, *Udumbara* of Kanakamuni, *Nyagradha* of Kasyapa and *Pippala* of Sakya Muni. The motifs of the worshipping the stupas by divine and human-being and by *Nagas*. All symbols have been presented in zoomorphic and anthorpomorphic forms. But in most cases artist transferred his tendency to a zoomorphic form or to an anthropomorphic one.[20]

Indian are is predominantly decorative in character. Bird occupies an important position, some birds, like peacock, swan, crow, dove, etc. feature in the stories of Jataka. Another animal symbol monkey has also been depicted in the Buddhist art in Bharhut, signifying the jataka story of the Mahakapi Jataka.

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A BRIEF HISTORY OF KOLKATA PANORAMA

Chandrani Pal

The historic Town Hall built in 1813, was designed by Col.. Garestin and further overhouled by him in 1819. It is an important landmark in the history of British architecture in kolkata in the early 19th century. The imposing two storeyed building with a magnificent flight of steps leading to the grand portico on the south has six Roman Doric Pillars that support a decorated wide cornice. The grand arcades and window have palladic influence. This building was an important landmark of kolkata in the 19th and the early 20th century that witnessed many historical events meetings and conferences. Unfortunately the building was occupied by some unauthorised people as such the building become abandoned.

In 2001 Calcutta Municipal Corporation under the guidance of Sri Prashanta Chatterjee, Ex-Mayor or of the Calcutta Municipal Corporation. He took initiative to recover building and established a high-tech museum. This museum in fact replaced the museum of the Calcutta Corporation that one sprang up in the municipal markets College Street (North Block). In 1932 under the initiative of Bidhan Chandra Roy when he was the Mayour of the Calcutta Corporation this took the proper shape. The final shape of the museum was given by Subhas Chandra Bose.

Due to untiring efforts of Prof. J.P. Neogi, it was developed primarily as a commercial museum and a popular meeting place and information centre of trade and industry that supported and helped the spirit to by "Swadeshi" (objects of cottage industry). After independence of the country it was developed as a Municipal Museum having model, chart, picture etc., showing the bright of city calcutta and its subsequent developments as well as the activities of the Calcutta Municipal Corporation in the domain of health and hygiene. Thus the birth of a new museum, Town Hall under the initiative of the Calcutta Corporation can be regarded as an important phenomenon in the annals of the museum movement of India.

The historic Town Hall now known as Kolkata Panorama is a high-tech story telling museum, that highlights the important historical episode of the 19th and the early 20th century. The museum at Town Hall due to its location in the historic building soon became a central attraction for some reasons. In 1990 the Town Hall was renovated by the Kolkata Municipal Corporation with the help of the Homage Trust, a private body dediated to conservation of heritage buildings in the city. Then it was thrown open to the public on the 9th May, 2002 under the Kolkata Museum Society.

It was originally constructed at the cost of Rupees Seven lakhs, raised from public lottery. This magnificent building was the witness of some great moment of history. In this Town Hall, J.C. Bose demonstrated this experiments with microwave. The people of Kolkata rejoiced over Swami Vivekananda's triupmph in Chicago at function here. The first protest meeting against the proposed partition of Bengal in 1905 was held here and also the 50th and 70th birthday of the Great poet Rabindra Nath Tagore were celebrated at this historic Hall.

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* Research Scholar.

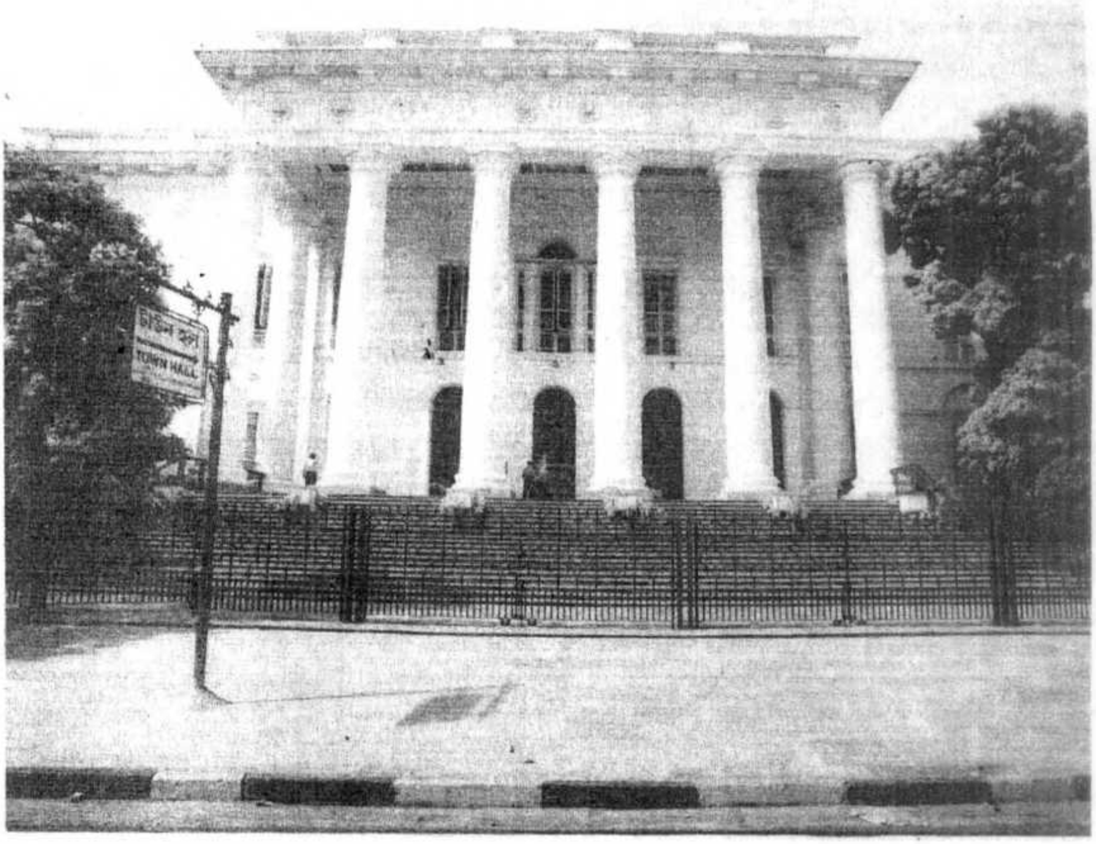
Application of new technique in presenting themes to he public have been shown in attractive manner. This museum applied advanced technology media presentation with animated period settings and walk through dioramas actuated by sound-light video vertual reality, animatronics, computer multi-media, multisereen LCD projections and simulated recreation of historic events of Kolkata. The history of Kolkata told with the help of a state-of the art communication technology can be operated by the visitors and they derive immense pleasure through this operation. Here visitor circulation is strictly directional. The authority has put the barries into the museum to control visitor movement. Guide lecturer service is available introduction to them in every enclave.

The Kolkata Panorama is divided into 20 enclaves thereby covering an area is 1200 sq. mt. The exhibits depict the story of Kolkata, its social, religious and political history its creative efforts in the field of education, freedom movement, performing art, science and technology. Main attractions of this museums are presentation of a fully computerised circarama where 12 minutes story of India's freedom movement is projected on a large circular sereen surrounding the visitors. The visitors have some exciting experience where they get personally involved with past historic scenes of 'Swadeshi' movement, 1928 session of the Indian National Congress the street scenes on the Independence Day of 1947. The other is the help of animatronies where visitors withness poet Rabindra Nath reciting 'Bharat Tirtha' and singing 'Tobu Mone Rekho'' (Still you remember me). Besides the above early Kolkata, Bengal Renaissance, the Golden time, Calcutta University, Public Theatres in Calcutta which is known as Cultural Capital of India etc. The different types of enclaves exibit the above scenes.

In the 2nd floor of the Town Hall a library and archives on Kolkata has been developed for scholars and students. There were more than 5500 old books on Kolkata which have been acquired from P.T. Nair, a renowned Kolkata specialist and more than 5000 rare and historical documents stored in computer for easy access of visitors.

The Panorama managed by Kolkata Museum Society. Where the Chief Minister of West Bengal is the President and the Mayor of Kolkata is the Vice-President. Members include renowned historians museologist, industrialists and administrator of the City. Dr. Saroj Ghosh, the creator of the Science City has been responsible for designing & representation of the exhibits. The administrative section is managed by Director. He is a employee of the Kolkata, Municipal Corporation. Many important institutions have provided resource materials. These include the The Bengal Academy, The Asiastic Society, Kolkata, The Indian Musuam, Kolkata, The Victoria Memorial, The National Library, The W.B. Archives, The W.B. Sahitya Academy, The W.B. Natya Academy and many others.

Various seminars, lectures, take place regularly in the museum on different occasions. The Panorama has already earned national and international repute. The Kolkata Panorama is not confined with in its four walls. Very recently this museum has extended its service in arranging in building a talking museum on Jawahar Lal Nehru, the first Prime Minister of India at Nehru Museum at Teenmurti Bhavan, New Delhi. Further Kolkata Panorama is also planning to assist in rearing up a science museum in Ahmedabad. A small team from this museum is responsible for the Science City of Kolkata. The Kolkata Panorama has gained international recognition and it is learnt that Yemen is planning to build up a museum is the model of this museum.



KOLKATA PANORAMA, TOWN HALL
ESTD. 1813

রবীন্দ্রভবন সংগ্রহশালা, শান্তিনিকেতন

প্রদীপ কুমার মণ্ডল

রবীন্দ্রনাথ ঠাকুর ১৯০১ থেকে ১৯৪১ সাল পর্যন্ত জীবনের শেষ প্রায় চল্লিশ বছর শান্তিনিকেতনে ছিলেন। তবে তিনি উত্তরায়ণ এলাকাতে স্থায়ীভাবে বসবাস করতে শুরু করলেন ১৯১৯ সাল থেকে। ঐ সময় শান্তিনিকেতন আশ্রমে ছাত্র-শিক্ষকদের ভিড় বেড়ে যায়। তাই রবীন্দ্রনাথ ঠাকুর অপেক্ষাকৃত শান্ত ও নির্জন পরিবেশ হিসাবে আশ্রমের উত্তরে এবং আগেকার মেলাপ্রাঙ্গনের পশ্চিমে কাঁটা ঝোপ ঝাড়ের পাশে একটি খড়ের চাল বিশিষ্ট মাটির বাড়ি কোণার্ক তৈরী করেন। এবং আর কয়েক বছরের মধ্যে ঐ বাড়ির উত্তরে পুত্র রবীন্দ্রনাথ ও পুত্রবধূ প্রতিমাদেবীর জন্য আর একটি মাটির বাড়ি তৈরী করেন, যার নাম দেন মৃণ্ময়ী। ১৯৩৪ সালে নতুন মাটির বাড়ি শ্যামলী তৈরীর সময় মৃণ্ময়ীকে ভেঙে দেওয়া হয়। তখন থেকে ঐ জায়গাটির নাম হয় মৃণ্ময়ী চাতাল। আর সে দিনের সেই মাটির বাড়ি কোণার্ক রবীন্দ্রনাথের জীবদ্দশাতেই পরিবর্তিত হতে হতে আজকের এই বহুছাদ বিশিষ্ট পাকাবাড়িতে পরিণত হয়েছে। রবীন্দ্রনাথের ইচ্ছানুসারে এই এলাকার মধ্যে সময়ে সময়ে আরও চারটি বাড়ি যথাক্রমে শ্যামলী, পুনশ্চ, ঊদিচি ও উদয়ন গড়ে উঠেছে। এর সঙ্গে পরে সংযোজিত হয়েছে রথীন্দ্রনাথের কর্মগৃহ গুহাঘর। ঐ ঘরেরই দোতলায় প্রতিমাদেবীর ছবি আঁকার ঘর বা চিত্রভানু এবং পাশে পম্পা সরোবর। রবীন্দ্রনাথ দেশ-বিদেশের বিভিন্ন গাছপালা দিয়ে উত্তরায়ণ বাগান সাজিয়েছিলেন আর রথীন্দ্রনাথ বিদেশ থেকে উদ্ভিদ বিজ্ঞানের অনেক পড়াশুনা করে এসে, বিভিন্ন পরীক্ষা-নিরীক্ষার মাধ্যমে বাগানের অভূতপূর্ব উন্নতিসাধন করেছিলেন। আম, পেয়ারার লতানো বাগান আজও তার সাক্ষ্য বহন করছে। রবীন্দ্রভবন প্রদর্শশালার বাড়িটির ভিত্তিপ্রস্তর স্থাপন করেন তৎকালীন প্রধানমন্ত্রী জওহরলাল নেহরু ১৯৫৮ সালে এবং জোড়াসাঁকোর বিচিত্রা বাড়ির নামানুসারে এই বাড়িটির নাম দেওয়া হয় বিচিত্রা। এই বিচিত্রা বাড়িতে সুধীরঞ্জন দাস উপাচার্য থাকাকালীন রবীন্দ্রনাথের জন্মশতবর্ষে ১৯৬১ সালে এই প্রদর্শশালাটি জনসাধারণের উদ্দেশ্যে খুলে দেওয়া হয়। তখনকার ঐ ছোট্ট প্রদর্শশালাটি বর্তমানে একটি বিশাল প্রদর্শশালাসহ রবীন্দ্রগবেষণালয়ে পরিণত হয়েছে।

রবীন্দ্রভবনের সংগ্রহের সংক্ষিপ্ত তালিকা :

রবীন্দ্রনাথের নিজস্ব আঁকা ছবি—১৫৮১টি

অন্যান্য নামী শিল্পীর আঁকা ছবি—৫৯৩টি

রবীন্দ্র পাণ্ডুলিপি—৮৬৬ খণ্ড

রবীন্দ্রনাথের চিঠিপত্র—৬০০০-এর কিছু বেশী।

৩০০০-এর মতো মূল বাকিগুলি প্রতিলিপি।

দুর্লভ শিল্প বস্তু—বর্তমানে নথিভুক্ত দুর্লভ শিল্পবস্তুর সংখ্যা ১৮২৮টি। এর মধ্যে ২০০৪-এর মার্চ মাসে ৪৯টি চুরি হয়ে গেছে।

আলোক চিত্র—প্রায় ২০,০০০টি, তবে নথিভুক্ত পুরানো ছবি—১৩৪১৩টি। এবং খুবই গুরুত্বপূর্ণ (রবীন্দ্রনাথ সহ)—৫২৪৩টি।

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* প্রাক্তন ছাত্র মিউজিওলজি বিভাগ, ক. বি. এবং উপ-অবেক্ষক, রবীন্দ্রভবন, বিশ্বভারতী।

তাছাড়া শ্রাব্য-দৃশ্য বিভাগে নিম্নলিখিত জিনিষগুলি সংরক্ষিত রয়েছে।

মাইক্রোফিল্ম নেগেটিভ—৩৭১টি।
সাদা কালো নেগেটিভ—৬৭,৪৮৯টি
রঙীন নেগেটিভ—৫৮৯টি
পুরানো নেগেটিভ—৫২৫৬টি
*১ শম্ভু সাহার সংগ্রহের নেগেটিভ—৯১৭টি
রঙীন স্লাইড—৫৯৭৯টি
আলোকচিত্র কমপ্যাক্ট ডিক্স—১৪টি
শ্রাব্য কমপ্যাক্ট ডিক্স—১৩১টি
গ্রামোফোন ডিস্ক—প্রায় ২৫০০টি
ক্যাসেট— প্রায় ২৫০০টি
**২ ওয়্যার রেকর্ড—১২টি
চলচ্চিত্র নেগেটিভ—৭টি
চলচ্চিত্র পজেটিভ—৫৮টি

রবীন্দ্রভবনের বিভাগসমূহ :

বাগান বাদ দিলে রবীন্দ্রভবনের মধ্যে বর্তমানে নিম্নলিখিত ৬টি বিভাগ বর্তমান—

ক) প্রদর্শ-শালা ও আলোকচিত্র অভিলেখাগার :

রবীন্দ্রনাথ ঠাকুর ও তাঁর পরিবারের বিভিন্ন ব্যক্তির ব্যবহৃত বস্তু সমূহ, স্মারক উপহার, রবীন্দ্রনাথের আঁকা ছবি, পদক, মানপত্র, আলোকচিত্র প্রভৃতি এই বিভাগে সযত্নে রক্ষিত আছে। বস্তুগুলির গুরুত্ব, নিরাপত্তা ও সংরক্ষণের কথা ভেরে স্টোরে ও কিছু বাতানুকূল ঘরে যথাসম্ভব নিরাপত্তা ও যত্ন সহযোগে রিজ্ঞানসম্মতভাবে রাখা আছে। যদিও ২০০৪ সালের মার্চ মাসের পর থেরে নিরাপত্তা জনিত কারণে প্রদর্শন-কক্ষ দোতলাতে তুলে দেওয়া হয়। যার ফলে, স্থানাভাবে, প্রদর্শন-কক্ষের সজ্জা সঠিকভাবে করা সম্ভব হয়নি। তাছাড়া দর্শক সমাগম বেশী হলে, বিশেষ করে গরমকালে বেশী সময় প্রদর্শন কক্ষে থাকা দায় হয়ে পড়ে।

স্থায়ী প্রদর্শনী ছাড়াও রবীন্দ্রভবনের পক্ষ থেকে অস্থায়ী প্রদর্শনী প্রদর্শন শালার মধ্যে এবং অধ্যক্ষের অনুমতি ক্রমে প্রদর্শন শালার বাইরে এমনকি প্রত্যন্ত গ্রামেও করা হয়।

গবেষণা ও অন্যান্য কাজের জন্য রবীন্দ্রভবনের সংগৃহীত আলোকচিত্র দেখা ও প্রয়োজনে প্রতিচিত্র পাওয়ারও ব্যবস্থা আছে।

প্রতি মাসে কমপক্ষে একটি রবীন্দ্রনাথ বা শান্তিনিকেতন সম্বন্ধীয় আলোচনা সভার আয়োজন করা হয়।

খ) পাণ্ডুলিপি অভিলেখাগার :

এই বিভাগের দায়িত্বে রবীন্দ্রনাথ ঠাকুরের লেখা অধিকাংশ পাণ্ডুলিপি, রবীন্দ্রনাথের লেখা ও রবীন্দ্রনাথকে লেখা অসংখ্য চিঠিপত্র প্রভৃতি বাতানুকূল গৃহে যত্নসহকারে রাখা আছে।

সাধারণতঃ গবেষকরা এই বিভাগটি ব্যবহার করেন রবীন্দ্রনাথের হাতের লেখা মূল পাণ্ডুলিপি, চিঠিপত্র প্রভৃতি দেখার জন্য। গবেষকদের কাজের সুবিধার জন্য দুটি মাইক্রোফিল্ম রিডার আছে।

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*১. রবীন্দ্রনাথের শেষ জীবনের আলোকচিত্র শিল্পী হলেন শম্ভু সাহা।

**২. ধাতব তারের মাধ্যমে রেকর্ডিং-এর ব্যবস্থা।

গ) শ্রাব্য-দৃশ্য বিভাগ :

এই বিভাগের প্রচুর রেকর্ড, ক্যাসেট, ফিল্ম, মাইক্রোফিল্ম, স্লাইড, নেগেটিভ সযত্নে বিজ্ঞানসম্মত সজ্জায় বাতানুকূল ঘরে রক্ষিত আছে। সব থেকে বড় ব্যাপার হলো সমস্ত পাণ্ডুলিপিগুলো মাইক্রোফিল্ম করার জন্য দুটি মাইক্রোফিল্ম তৈরীর মেশিন আছে। পুরানো ছবির নেগেটিভ তৈরীর জন্য অত্যাধুনিক ও দামী মেশিনসহ ক্যামেরা রয়েছে।

কোন দর্শক বা গবেষক আলোকচিত্র অভিলেখাগারে কোন আলোকচিত্র দেখে কোনো কোনো আলোকচিত্রের প্রতিচিত্র নেওয়ার জন্য আবেদন করলে, অধ্যক্ষের অনুমতিক্রমে এবং নির্ধারিত মূল্যের বিনিময়ে তা পেয়ে থাকে। এবং এই বিভাগ তার সংরক্ষিত নেগেটিভ থেকে নির্দিষ্ট আলোকচিত্র তৈরী করে দেওয়ার ব্যবস্থা করে।

তাছাড়া রবীন্দ্রভবন ও বিশ্বভারতীর সমস্ত গুরুত্বপূর্ণ অনুষ্ঠানের আলোকচিত্র ও ক্যাসেট তৈরী করে এবং নেগেটিভ ও ক্যাসেট সংরক্ষণ করে থাকে।

ঘ) সংরক্ষণ বিভাগ :

রবীন্দ্রভবনের উত্তর পাশে রবীন্দ্রনাথ ঠাকুরের সময় ব্যবহৃত কাছারী বাড়িতে এই বিভাগ অবস্থিত। এই বিভাগের কাজ হলো অভিলেখাগার, গ্রন্থাগার ও প্রদর্শশালার বিভিন্ন সামগ্রীর বিজ্ঞানসম্মত পদ্ধতিতে সংরক্ষণ করা। রবীন্দ্রনাথের পাণ্ডুলিপি, পুস্তকসমূহ, আঁকাছবি, আলোকচিত্র প্রভৃতি যাতে কোনভাবে কীটপতঙ্গ, ছত্রাক ও বায়ুদূষণ প্রভৃতি দ্বারা কোনভাবে নষ্ট না হয় তার ব্যবস্থা করা হয়। কাগজের বস্তু সমূহের অম্লতা দূরীকরণ, স্বচ্ছ কাগজ মোড়ার ব্যবস্থা (Lamination), বই বাঁধানো ও আলোকচিত্র বাঁধানো ইত্যাদির ব্যবস্থা আছে।

ঙ) গ্রন্থাগার :

গ্রন্থাগারটি ১০০০ বর্গফুটের বেশী জায়গা নিয়ে রবীন্দ্রভবনের দোতলাতে অবস্থিত। গ্রন্থাগারটি কোন দিক থেকেই ছোট নয়, কারণ বর্তমানে সংগৃহীত বই-এর সংখ্যা ৪০,০০০ ছাড়িয়ে গেছে এবং বাঁধানো পত্রিকা ৩০০০-এর বেশী। এই বই ও পত্রিকাগুলির অনেকগুলিই রবীন্দ্রনাথ ঠাকুরের সই করা। রবীন্দ্রনাথ ঠাকুরের কিছু কিছু বই বিশ্বভারতীর কেন্দ্রীয় পাঠাগার, কলাভবন গ্রন্থাগার প্রভৃতি স্থানে ছড়িয়ে ছিটিয়ে থাকলেও অধিকাংশ রবীন্দ্রভবনে নিয়ে আসা হয়েছে। পাঠকদের পড়বার জন্য একটি সুন্দর পাঠকক্ষও আছে।

চ) রবীন্দ্রচর্চা প্রকল্প :

কালিদাস ভট্টাচার্য থাকাকালীন পুলিনবিহারী সেনের অভিভাবকত্বে বিভাগটির সূচনা হয়। কানাই সামন্ত ও চিত্তরঞ্জন দেব প্রকল্পটির সঙ্গে যুক্ত ছিলেন। রবীন্দ্রনাথের অপ্রকাশিত ও অগ্রন্থিত রচনাগুলি সংকলন ও সম্পাদনা করে রবীন্দ্র-রচনাবলীর পরবর্তী খণ্ডগুলি এবং রবীন্দ্রনাথের নতুন সংস্করণ প্রস্তুত করা, চিঠিপত্র সম্পাদনা করা প্রভৃতি এই বিভাগের কাজের অন্তর্গত। এই বিভাগ থেকে রবীন্দ্রনাথের অপ্রকাশিত রচনা, চিঠিপত্র, পাণ্ডুলিপির পাঠান্তর প্রভৃতি অবলম্বনে রবীন্দ্রবীক্ষা পত্রিকাটি প্রকাশিত হয়। এই প্রকল্পের কাজ সঠিকভাবে পরিচালনা করার জন্য একজন অধ্যাপক এবং একজন গবেষণা সহকারী আছেন। যদিও অধ্যাপকের পদটি দীর্ঘদিন ধরে শূন্য পড়ে আছে।

ছ) বৈদ্যুতিন বহুমাধ্যম প্রকল্প :

রবীন্দ্রনাথ ঠাকুরের কর্মজীবন ও বহুমুখী প্রতিভা দিয়ে বিশ্বকোষ রচনার জন্য ভারত সরকার ৫০ লক্ষ টাকা খরচ করে একটি ত্রৈবার্ষিক প্রকল্প মঞ্জুর করেন। ঐ অর্থের আনুকূল্যে শ্রাব্য-দৃশ্য বিভাগের উপরে একটি বহুমাধ্যম প্রকল্প গড়ে ওঠে। এই প্রকল্প রবীন্দ্রনাথ ও রবীন্দ্রভবন সংক্রান্ত সমস্ত বিষয় সংখ্যায়ণে (Digitisation) নিমগ্ন।

রবীন্দ্রভবনের কার্যাবলী :

রবীন্দ্রভবন একটি নিছক প্রদর্শশালা বা গ্রন্থাগার নয়, এটি প্রকৃতপক্ষে রবীন্দ্র গবেষণাগার, যেখানে রবীন্দ্রনাথের কর্মজীবন ও জীবন যাপন সম্বন্ধে সাধারণ মানুষকে জানানো হয়। নিম্নলিখিত প্রক্রিয়ায় রবীন্দ্র-গবেষণাভবন কার্যকরী হয়—

১) স্থায়ী প্রদর্শনী : প্রদর্শশালার স্থায়ী প্রদর্শন বিচিত্রা বাড়ির দোতলায় পশ্চিমদিকের একটি মাত্র ঘরে বর্তমান তাই ভবনের অতি অল্প বস্তুই প্রদর্শন করা হয়। তবে উত্তরায়ণের পাঁচটি ঘরেও বেশকিছু প্রদর্শ-বস্তু জনসাধারণের দেখবার জন্য রক্ষিত আছে। দর্শকদের বারবার প্রদর্শশালা আসার ব্যাপারে আকর্ষিত করার জন্য এবং প্রতিবারই নতুন কিছু দেখার আনন্দ দেবার জন্য প্রতিমাসেই কিছু কিছু দুর্লভ শিল্পবস্তু পরিবর্তন করার কথাবার্তা চলছে।

২) অস্থায়ী প্রদর্শনী : কোন প্রতিষ্ঠান বা উৎসব পরিচালন সমিতির অনুরোধ রবীন্দ্রভবন অস্থায়ী প্রদর্শন ভবনের বাইরেও ব্যবস্থা করে থাকে। তাছাড়া বিভিন্ন গুরুত্বপূর্ণ দিনে ভবনের মধ্যে অস্থায়ী প্রদর্শনীর ব্যবস্থা করা হয়।

৩) আলোচনা সভা : প্রতিমাসে কমপক্ষে একটি আলোচনা সভার আয়োজন হয়। আলোচনা প্রবাহ নামের এই আলোচনা সভাতে একজন করে রবীন্দ্র-গবেষককে আমন্ত্রণ করা হয় রবীন্দ্রনাথ বা শান্তিনিকেতন বিষয়ে বক্তব্য রাখার জন্য। এছাড়া বিশ্বভারতীর সমস্ত ছাত্র-ছাত্রী, শিক্ষক, গবেষক সবাইকে আমন্ত্রণ জানানো হয়।

৪) চলচ্চিত্র প্রদর্শনী : কোন প্রতিষ্ঠান থেকে একদল দর্শক এসে অধ্যক্ষকে অনুরোধ করলে, শ্রাব্য-দৃশ্য বিভাগের সহায়তায় রবীন্দ্রনাথ সম্বন্ধীয় বিভিন্ন চলচ্চিত্র দেখানো হয়।

৫) গবেষণার কাজে সাহায্য :

অ) পাঠকক্ষ : এই ঘরটিতে বসে ছাত্র, শিক্ষক ও গবেষক গ্রন্থাগারের যে কোন বই তুলে পড়তে পারেন। কোন বই বাড়িতে নিয়ে যাবার অনুমতি নেই। পাঠকদের সহযোগিতা করার জন্য কয়েকজন গ্রন্থাগাব সহকারী আছেন।

আ) সংবাদপত্রের কাগজ কাটিং : রবীন্দ্রনাথ বা বিশ্বভারতী সম্পর্কে কোন ঘটনা সংবাদপত্রে প্রকাশিত হলে, সেই প্রয়োজনীয় খবরটি কেটে খাতায় আঠা দিয়ে লাগিয়ে রাখা হয়। এই খাতা থেকে অনেক তথ্য পরে গবেষণার কাজে লাগে।

ই) রবীন্দ্রবীক্ষা প্রকাশনা : রবীন্দ্রবীক্ষা পত্রিকাটি প্রকাশনার জন্য রবীন্দ্র-গবেষকরা ভবনে আসেন এবং প্রয়োজনীয় পুস্তক পাঠ এবং বিভিন্ন বিষয়ে আলোচনা করেন। প্রতি তিনমাসের সমস্ত প্রদর্শনী, আলোচনা সভার যথাযথ পত্রিকাটিতে উল্লেখ থাকে।

ঈ) প্রতিলিপি ও প্রতি আলোকচিত্র : কোন দর্শক বা গবেষক প্রয়োজনে অভিলেখাগারে রবীন্দ্রনাথ ঠাকুরের লেখা পাণ্ডুলিপি দেখতে পারেন, মাইক্রোফিল্ম দেখতে পারেন, তেমনি অধ্যক্ষের অনুমতিক্রমে পাণ্ডুলিপির প্রতিলিপিও পেতে পারেন। তাছাড়া আলোকচিত্র অভিলেখাগারের কোন চিত্রের প্রয়োজন হলেও অধ্যক্ষের অনুমতিক্রমে এবং উপযুক্ত মূল্যের বিনিময়ে শ্রাব্য-দৃশ্য বিভাগ থেকে প্রতি আলোকচিত্র পাওয়া যায়।

উ) বাগান : উত্তরায়ণ এলাকাতে রবীন্দ্রনাথ ঠাকুর ও রথীন্দ্রনাথ ঠাকুরের প্রচেষ্টায় দেশ-বিদেশের বিভিন্ন গাছপালা দিয়ে এক অপূর্ব বাগান তৈরী হয়েছে। ঐ সমস্ত দুর্লভ গাছপালা সম্বলিত বাগান উদ্ভিদ বিজ্ঞানের ছাত্রদের ভীষণ সাহায্য করে।

ঊ) স্থাপত্যচর্চ্চা : রবীন্দ্রনাথ উত্তরায়ণের যে পাঁচটি বাড়ি তৈরী করিয়েছিলেন তার প্রতিটির গঠন ও কারুকার্যাবলী বর্তমান স্থাপত্য বিজ্ঞানের ছাত্রদের গবেষণার বিষয়।

এককথায় রবীন্দ্রভবন শুধুমাত্র প্রদর্শশালা বা গ্রন্থাগার নয়, এটি একটি বিখ্যাত গবেষণাগার। রবীন্দ্রনাথের সম্বন্ধে যে কোন গবেষণা করতে গেলে বা রবীন্দ্রনাথ সম্বন্ধে কোন বই লিখতে গেলে রবীন্দ্রভবনের সহযোগিতা খুবই প্রয়োজন। শুধু তাই নয়, রবীন্দ্রভবনের গুরুত্বপূর্ণ পদে আসীন সমস্ত ব্যক্তিই এক-একজন রবীন্দ্র-গবেষক ও অভিজ্ঞ ব্যক্তি। তাই তাদের সাহায্যও যেকোন গবেষকের কাছে অতি গুরুত্বপূর্ণ।

৬) প্রদর্শশালা প্রদর্শক : প্রদর্শশালাতে স্থায়ী পদে একজন অভিজ্ঞ প্রদর্শক আছেন। তিনি বিশিষ্ট অতিথি দর্শককে প্রদর্শশালা ও উত্তরায়ণ এলাকার বাড়িগুলি দেখতে সাহায্য করেন। আগে থেকে জানানো থাকলে যেকোন দর্শককেই এ ব্যাপারে সাহায্য করা হয়।

৭) অভ্যর্থনা কেন্দ্র : প্রদর্শশালার প্রবেশ পথেই একটি অভ্যর্থনা কেন্দ্র আছে, যেখানে বিভিন্ন বই, আলোকচিত্র ও রবীন্দ্রনাথের আঁকা বিভিন্ন ছবির প্রতিচিত্র নির্ধারিত অর্থের বিনিময়ে কিনতে পাওয়া যায়। তাছাড়া প্রবেশ দ্বারের কাছে দর্শকদের জুতো ও ব্যাগ রাখার সুবন্দোবস্ত আছে।

৮) রবীন্দ্র শিক্ষা : বিশ্বভারতীর সমস্ত ছাত্র-ছাত্রীকেই রবীন্দ্রনাথ ঠাকুর সম্পর্কে এক বিশেষ শিক্ষা নিতে হয়। রবীন্দ্রভবন এই শিক্ষায় অনেকাংশে সাহায্য করে।

ভবিষ্যৎ পরিকল্পনা : যে কোন সংস্থা বা প্রতিষ্ঠানের একটি সুনির্দিষ্ট ভবিষ্যৎ পরিকল্পনা থাকে। এক্ষেত্রে আর্থিক সমস্যা খুব একটা না থাকায় মনে হয় রবীন্দ্রভবনের ভবিষ্যৎ পরিকল্পনা সাফল্য মণ্ডিত করা যাবে। ভবনের অধ্যক্ষা ও আধিকারিকদের আলোচনাক্রমে যে পরিকল্পনাগুলি ঠিক হয়েছে সেগুলি হলো—

১) মাসিক প্রদর্শনী : যদিও মাসে প্রায় একটি করে প্রদর্শনী এখনো হয়। তবুও এর জন্য স্থায়ী পরিকল্পনা ও উপযুক্ত পরিকাঠামোর ব্যবস্থা করা থাকবে।

২) স্থায়ী প্রদর্শনীর পরিবর্তন : উপাচার্য ও অধ্যক্ষের নেতৃত্বে একটি এক্সপার্ট কমিটি তৈরী হয়েছে, যারা অত্যাধুনিক ও বিজ্ঞানসম্মত ভাবে সম্পূর্ণ প্রদর্শশালাটিকে নতুন করে ঢেলে সাজানোর ব্যবস্থা করছেন।

৩) বিজ্ঞানসম্মত ভান্ডার ঘর : প্রদর্শশালার মোট সংরক্ষিত বস্তুর মাত্র ছয় শতাংশ দুর্লভ শিল্পবস্তু আমরা প্রদর্শশালাতে দেখানোর সুযোগ পাই। বাকি দুর্লভ শিল্পবস্তুগুলি স্টোরে রাখা আছে। তবে সঠিক বিজ্ঞানসম্মত সংরক্ষণের জন্য একটি বিজ্ঞানসম্মত স্টোর তৈরীর পরিকল্পনা আছে।

৪) সংখ্যায়ণ (Digitization) : রবীন্দ্রভবনের আলোকচিত্র অভিলেখাগার, পাণ্ডুলিপি অভিলেখাগার ও গ্রন্থাগারে পূর্ণ সংখ্যায়ণ ব্যবস্থার প্রচলন শীঘ্র-ই চালু হওয়ার কথা। শ্রাব্য-দৃশ্য বিভাগে-ও আলোকচিত্র তৈরীর ব্যাপারে সমস্যা হচ্ছে। কারণ এক্ষেত্রে বড় আলোকচিত্র তৈরীর কাগজের অপ্রতুলতা দেখা দিয়েছে। এই ব্যাপারে উপযুক্ত আধুনিক প্রযুক্তি ব্যবস্থার কথা চলছে। অধ্যক্ষা এই ব্যাপারে খুবই সক্রিয়।

৫) শীততাপ নিয়ন্ত্রণ ব্যবস্থা : সামনের বছর-ই সম্পূর্ণ ভবনটি শীতাতপ নিয়ন্ত্রণের ব্যবস্থা হবে। প্রয়োজনীয় জায়গাগুলিতে দিবা-রাত্রি শীতাতপ নিয়ন্ত্রণের জন্য উপযুক্ত জেনারেটার-এরও ব্যবস্থা থাকবে। যার ফলে ভবনের বিভিন্ন অংশে রাখা দুর্লভ শিল্পবস্তুগুলি ও গ্রন্থাগারের মূল্যবান বইসমূহের সংরক্ষণ অনেক বিজ্ঞানসম্মত হবে। যদিও বর্তমানে স্ট্রং রুম, শ্রাব্য-দৃশ্য বিভাগ ও বহুমাধ্যম প্রকল্পে শীতাতপ নিয়ন্ত্রণের ব্যবস্থা রয়েছে।

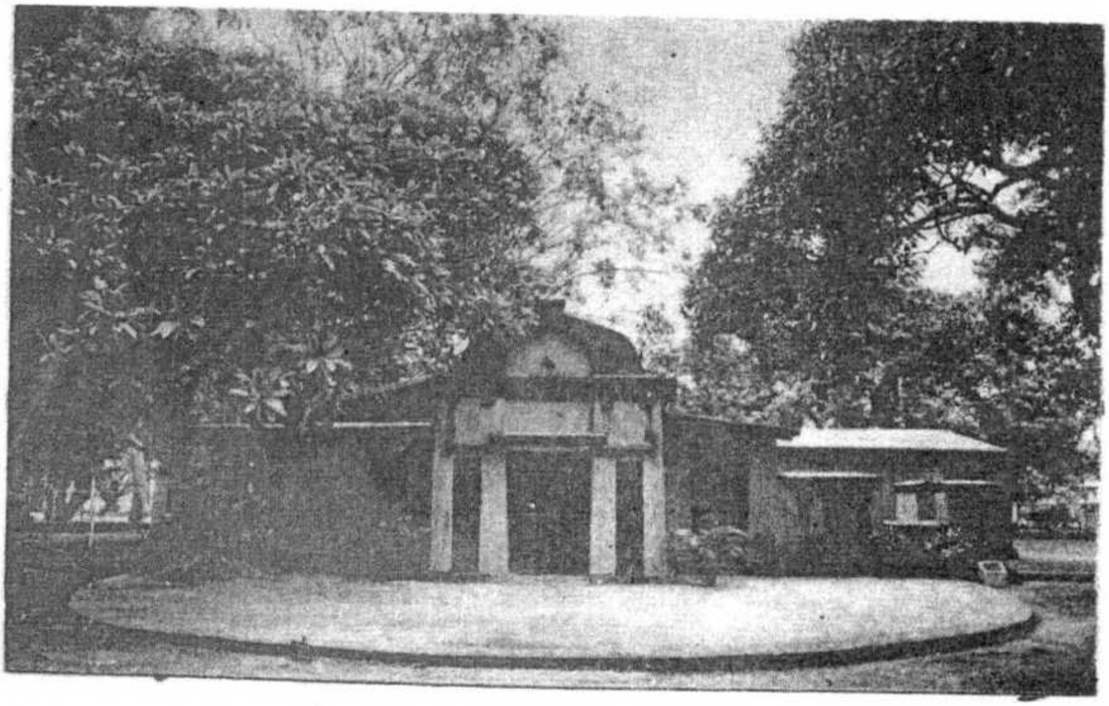
৬) উত্তরায়ণ গৃহসমূহের সংস্কার : উত্তরায়ণ এলাকাতে যে পাঁচটি বাড়ি রয়েছে তাদের সংরক্ষণের কাজ অনেকাংশে এগিয়ে গেছে। সম্পূর্ণ সংস্কার হয়ে গেলে, রবীন্দ্রনাথ ঠাকুরের আমলে বাড়িগুলি যেভাবে সাজানো হয়েছিল ঠিক সেইভাবে সাজানোর ব্যবস্থা হবে। শুধু তাই নয়, উত্তরায়ণ বাগান, পম্পা সরোবর, গুহাঘর ও চিত্রভানু প্রভৃতি ও সঠিকভাবে পূর্বের মতো সংস্কারের জন্য কেন্দ্রীয় সরকারের কাছে আর্থিক সাহায্যের জন্য আবেদন করা হয়েছে।

৭) সংরক্ষণ বিভাগের উন্নয়ন : রবীন্দ্রভবনের কাছে যে সমস্ত দুর্লভ শিল্পবস্তু আছে যেগুলোকে দূষণের হাত থেকে সঠিকভাবে বিজ্ঞানসম্মত সংরক্ষণের জন্য অত্যাধুনিক যন্ত্রপাতি আমদানির ব্যবস্থা চলছে। আশা করা যাচ্ছে, ঐ সমস্ত উন্নত প্রযুক্তির সাহায্যে দুর্লভ শিল্পবস্তুগুলোর ক্ষয়ের হার অনেকাংশে কমিয়ে ফেলা যাবে।

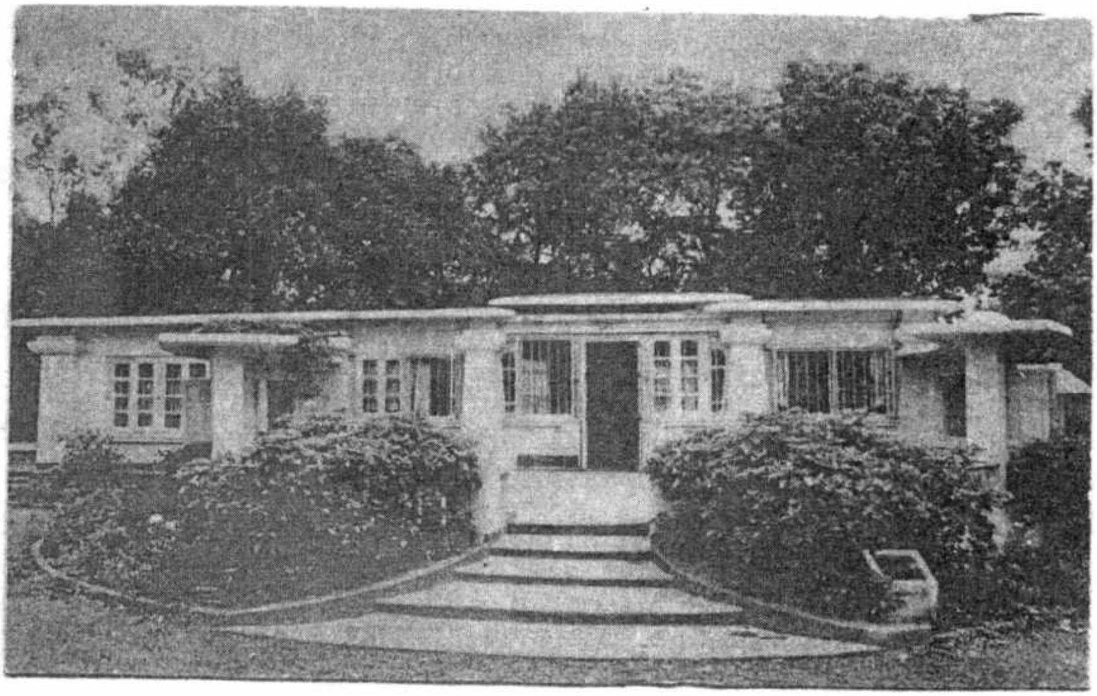
পরিশেষে বলা যায়, রবীন্দ্রনাথের স্মৃতি বিজড়িত এই সমস্ত বাড়ি ও বস্তুসমূহের সঠিক সংরক্ষণের ব্যবস্থা সংগ্রহশালা কর্তৃপক্ষ সরকার সবাই করছেন। কিন্তু তাঁদের সঙ্গে সাধারণ মানুষ ও দর্শকদেরও কিছুটা দায়িত্ব থেকে যায়। কর্তৃপক্ষ যখন পুরানো বাড়িগুলো সঠিক পরিচর্যা করতে হিমসিম খাচ্ছেন, তখন মুষ্টিমেয় দর্শক সুযোগ পেলেই উত্তরায়ণের বাড়িগুলির দরজা, জানালা ও আসবাবে নিজের নাম ও তাদের প্রিয়জনের নাম খোদাই করে দিচ্ছে, যা খুবই দুঃখজনক। তার থেকে আসুন আমরা সবাই মিলে ঐ ঐতিহাসিক প্রাঙ্গণকে আরো সুন্দর করে তুলি।

উদয়ন

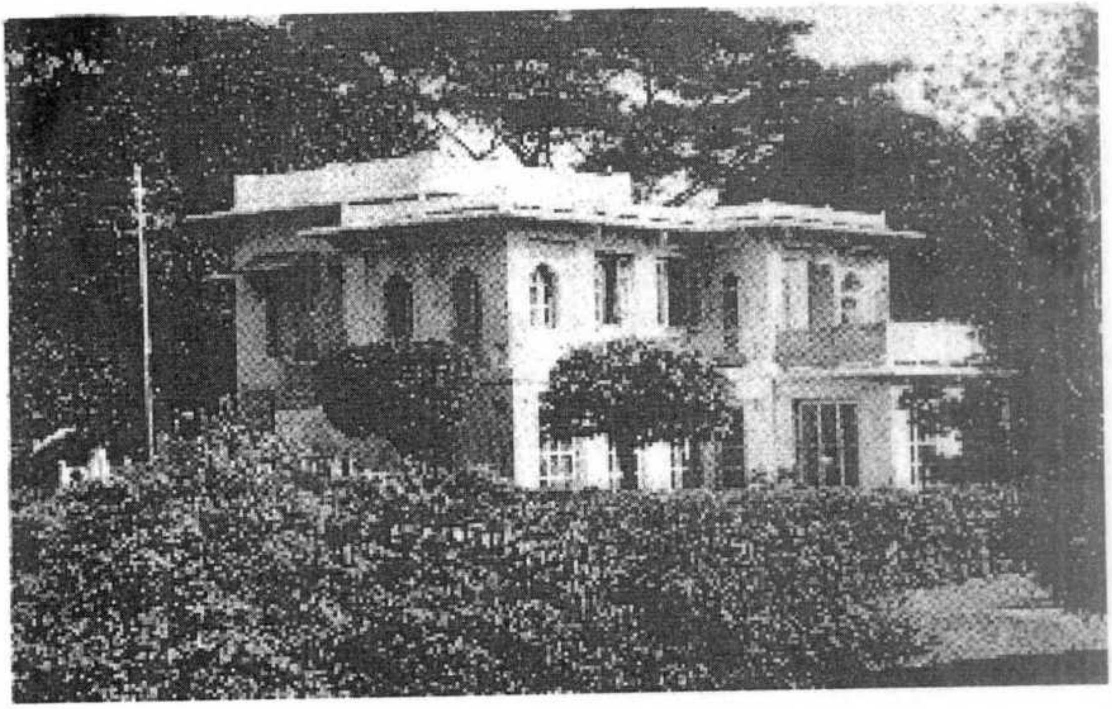
কোণার্ক



শ্যামলী



পুনশ্চ



উদীচি

বিজয়পুরের সন্ধানে

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*তপন কুমার দাস**

প্রাচীন সাহিত্য ও লিপিমালায় প্রাচীন বাংলার যে কয়েকটি নগর ও রাজধানীর নাম আমরা পাই তার মধ্যে সেনরাজ লক্ষ্মণসেনের রাজধানী 'বিজয়পুর' উল্লেখযোগ্য। সেন আমলে, নিদেনপক্ষে লক্ষ্মণ সেনের শাসনকালে এই বিজয়পুর যে সেন সাম্রাজ্যের একটি রাজনৈতিক কেন্দ্রবিন্দুতে পরিণত হয়েছিল তা আমাদের জানাচ্ছেন লক্ষ্মণ সেনের সভাকবি ধোয়ী। লক্ষ্মণসেনের রাজসভায় যে কজন সভাকবি ছিলেন তাঁদের মধ্যে অগ্রগণ্য ছিলেন ধোয়ী। ধোয়ী তাঁর 'পবনদূত'-এ এই 'বিজয়পুর' রাজধানীর ঐশ্বর্য ও আড়ম্বরের এক বিস্তৃত বর্ণনা দিয়েছেন। তাঁর ভাষায় "স্কন্ধাবারং বিজয়পুরি মত্যুন্নতাম্ রাজধানীম্।"

কিন্তু কবি ধোয়ীতো লিখে গেছেন খ্রীষ্টীয় দ্বাদশ শতকে (আনুমানিক ১১৭৯-১২০৬ খ্রীষ্টাব্দে)। তারপর কত যুগ কেটে গেছে। কত ঝড় বৃষ্টি বয়ে গেছে এই বিজয়পুরের উপর দিয়ে। অবশেষে, উত্থান ও পতন — ইতিহাসের এই ধ্রুব সত্যকে পাথেয় করে, রাজধানী বিজয়পুর কালের গতিতে ধ্বংস হয়ে গেছে। তাই এই একবিংশ শতকের দ্বারপ্রান্তে এসে আমরা কোথায়, কিভাবে খুঁজবো বিলুপ্ত সেই রাজধানী বিজয়পুর-কে?

বিজয়পুরের বর্তমান ভৌগোলিক স্থিতি অনুসন্ধান করার আগে কবি ধোয়ী বিজয়পুরের ভৌগোলিক অবস্থান ও তার পারিপার্শ্বিক অবস্থা সম্পর্কে কি বলে গেছেন তা জানা দরকার। ধোয়ী তাঁর পবনদূতে বলে গেছেন সেন রাজধানী বিজয়পুর ছিল "ভাগীরথ্যাস্তপনতনয়া যত নির্যাতি দেবী" অর্থাৎ তপন-তনয়া যমুনা ও ভাগীরথীর সঙ্গমের অদূরেই অবস্থিতি ছিল বিজয়পুরের। অতএব, কবি ধোয়ীর পবনদূতের সাক্ষ্য অনুযায়ী গঙ্গা ও যমুনা নদীর সঙ্গমস্থলের নিকটবর্তী স্থানেই অবস্থান করত বিজয়পুর। দ্বিতীয়ত; পবনদূতে বলা হয়েছে যে রাজধানী বিজয়পুরের সুউচ্চ দেউলে ভগবান মুরারী ও মহাদেব অধিষ্ঠিত আছেন। এই দুটি সূত্র ধরে সেকালের বিজয়পুরের বর্তমান ভৌগোলিক অবস্থান অনুসন্ধানে অগ্রসর হওয়া যাক।

অবশ্য বিজয়পুরকে খুঁজে বেড়ানোর প্রচেষ্টা নতুন নয়। উনবিংশ শতকের শেষপ্রান্ত থেকে বিশেষ করে বিংশ শতকের শুরু থেকেই একাধিক গবেষক একাজে অগ্রসর হয়েছেন এবং নিজেদের মতামত প্রকাশ করে গেছেন। কিন্তু দুঃখের বিষয়, তাঁদের দেওয়া প্রাচীন বিজয়পুরের অবস্থান সংক্রান্ত তথ্য ঐতিহাসিক-ভূগোলের (historical-geography) বিচার বিশ্লেষণে গ্রহণযোগ্য বলে মনে হয়নি। ক্ষেত্রানুসন্ধানের ফলে প্রাপ্ত তথ্যের ভিত্তিতে যে তাঁদের মতামত প্রতিষ্ঠিত নয়, সেকথাও বললে অত্যুক্তি হয় না।

প্রায় শত বৎসর পূর্বে, ১৯০৮ সালে মনোমোহন চক্রবর্ত্তী প্রাচীন বিজয়পুরের বর্তমান ভৌগোলিক স্থিতি প্রসঙ্গ আলোচনা করতে গিয়ে বলেছেন যে বিজয়পুরের অপর নাম সম্ভবত নদীয়া।[২] অদ্ভুত ব্যাপার! কি দেখে, বা কিসের ভিত্তিতে তিনি বর্তমান নদীয়াকে প্রাচীন বিজয়পুরের সঙ্গে সনাক্ত করলেন তা বুঝে ওঠা ভার। নদীয়ার কাছে না হয় গঙ্গা নদী আছে, কিন্তু যমুনা নদী আছে কি?

১৯১৪ খ্রীষ্টাব্দে সতীশচন্দ্র মিত্র আবার অন্য কথা শোনালেন। তিনি বলেছেন—"নবদ্বীপে সেন রাজগণের কোন রাজনৈতিক শাসনকেন্দ্র ছিল না। বল্লাল সেন বৃদ্ধ বয়সে এই স্থানে গঙ্গাবাসের আবাস স্থির করিয়াছিলেন। কুলকারিকা হইতে জানা যায় : 'মুক্তিহেতু বল্লাল আসিল গঙ্গা স্থান/জহ্নুনগরোত্তরে করে যে বাসস্থান।"...ব্রাহ্মণ পণ্ডিতের আগমনে

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* অধ্যাপক, প্রাচীন ভারতীয় ইতিহাস ও সংস্কৃতি বিভাগ, কলিকাতা বিশ্ববিদ্যালয়।

এইস্থান একটি প্রসিদ্ধ শিক্ষাকেন্দ্র হইয়া পড়িয়াছিল। লক্ষ্মণসেনের সময়েও এখানে রাজধানী ছিল না, দুর্গ বা সৈন্যাবাস ছিল না। সুতরাং ইহাকে আমরা প্রাদেশিক রাজধানী বলিতে পারি না। ....যশোহর জেলায় নড়াইল সাবডিভিশনের মধ্যে, সিঙ্গিয়া রেলওয়ে স্টেশনের সন্নিকটে সেখহাটি বলিয়া একটি গ্রাম আছে। ইহার নিম্ন দিয়া এক্ষণে ভৈরব প্রবাহিত, অপরপারে জগন্নাথপুর গ্রাম। এই জগন্নাথপুর-সেখহাটিতে পূর্বে কোন প্রাদেশিক রাজধানী ছিল বলিয়া মনে করি।"[৩]

১৯৩২ খ্রীষ্টাব্দে ঐতিহাসিক প্রবোধচন্দ্র সেন সেনরাজধানী বিজয়পুরকে সনাক্ত করেছেন বর্তমান নবদ্বীপ বা নদীয়ার সঙ্গে। সেই সঙ্গে বর্তমান বাংলাদেশ রাষ্ট্রের বিজয়নগর যে সেন রাজধানী বিজয়পুর হতে পারে না সেকথাও বলতে দ্বিধা করেন নি।[৪] রাজশাহী জেলার বিজয়নগর যে সেন রাজধানী বিজয়পুর নয়, সেকথা মেনে নেওয়া যায়। কিন্তু বর্তমান নবদ্বীপ বা নদীয়াই যে সেকালের বিজয়পুর সেকথা মেনে নেওয়ার যুক্তি কোথায়? নবদ্বীপ বা নদীয়ার কাছে ভাগীরথী বা গঙ্গা ছাড়া যমুনা নামে কোন নদী তো নেই। অথচ ধোয়ী তাঁর পবনদূতে স্পষ্টই ইঙ্গিত দিয়ে গেছেন যে বিজয়পুরের অবস্থান ছিল গঙ্গা ও যমুনা নদীর সঙ্গমস্থলে, ত্রিবেণীর অদূরে।

১৯৪৩-এ ঐতিহাসিক হেমচন্দ্র রায়চৌধুরী সেন রাজধানী বিজয়পুরের বর্তমান ভৌগোলিক স্থিতি কোথায় সে সম্পর্কে বলতে গিয়ে মন্তব্য করেছেন—"The narrative of Dhoyi makes it likely that Vijaypura did not lie so far north of Triveni as Nadiya which was the seat of 'Ray Lakhmaniah' at the time of khilji raid. It cannot be identified with Vijaynagar in Rajshahi."[৫]

১৯৪৯ খ্রীষ্টাব্দে ঐতিহাসিক নীহাররঞ্জন রায় বিজয়পুরের বর্তমান অবস্থান প্রসঙ্গে বলেছেন—"ধোয়ীর বিবরণীর আক্ষরিক অনুসরণ করিলে বিজয়পুর যে তপন-তনয়া যমুনা ও ভাগীরথী সঙ্গমের অদূরে অবস্থিত ছিল তাহা অস্বীকার করিবার উপায় থাকে না। কেহ কেহ বিজয়পুরকে নবদ্বীপ-নদীয়া বা রাজশাহী জেলার বিজয়নগরের সঙ্গে এক এবং অভিন্ন বলিয়া মনে করিয়াছেন। নবদ্বীপ-নদীয়া ত্রিবেণীর কিছুটা দূরে, পবনদূতের বর্ণনা অনুসারে বিজয়পুর ত্রিবেণী হইতে এতদূরে হইতে পারে না।"[৬]

১৯৪৫ খ্রীষ্টাব্দে ঐতিহাসিক রমেশচন্দ্র মজুমদার সেন রাজধানী বিজয়পুরের অবস্থান সম্পর্কে বলেছেন—"কবি ধোয়ী রচিত 'পবনদূত' কাব্যে গঙ্গা-তীরবর্তী বিজয়পুরনগর লক্ষ্মণসেনের রাজধানীরূপে বর্ণিত হইয়াছে। এই বিজয়পুরের অবস্থিতি সম্বন্ধে পণ্ডিতগণের মধ্যে মতভেদ আছে। কেহ কেহ বিজয়পুরকে নদীয়ার সহিত অভিন্ন বলিয়া গ্রহণ করিয়াছেন। আবার কাহারও মতে, রাজসাহীর অন্তগর্ত রামপুর বোয়ালিয়ার দশ মাইল পশ্চিমে অবস্থিত বিজয়নগর গ্রামই প্রাচীন বিজয়পুর, কিন্তু পবনদূতে, ত্রিবেণী সঙ্গমের পরই বিজয়পুরের উল্লেখ করা হইয়াছে এবং গঙ্গানদী পার হইবার কোন প্রসঙ্গ নাই। সুতরাং বর্তমান নদীয়াই প্রাচীন বিজয়পুর, এই মতটিই সমীচীন বলিয়া মনে হয়।"[৭] কিন্তু কবি ধোয়ী তো তাঁর পবনদূত কাব্যে বিজয়পুরের অবস্থান নির্দেশ করেছেন গঙ্গা-যমুনার সঙ্গমস্থলের অদূরে। অথচ ডঃ মজুমদার বিজয়পুরের অবস্থান প্রসঙ্গে যে "গঙ্গা তীরবর্তী" বলেছেন তাতো ঠিক নয়।

এবার দেখা যাক ১৯৭৫-এ মোহিত রায় বিজয়পুর রাজধানীর অবস্থান প্রসঙ্গে কি বলেছেন। মোহিত রায় বলেছেন—"সেনরাজ সামন্তসেন বৃদ্ধ বয়সে ভাগীরথী ও জলঙ্গি নদীর সঙ্গমস্থলে বসতি স্থাপন করেন। সামন্তসেনের পরে রাজ্যভার গ্রহণ করেন তাঁর পৌত্র বিজয়সেন। অনেকের মতে, তিনি নবদ্বীপে রাজধানী স্থাপন করে তার নামকরণ করেন 'বিজয়পুর'। অধিকাংশ ঐতিহাসিকই বিজয়সেন কর্তৃক প্রতিষ্ঠিত বিজয়পুরকে বর্তমান নবদ্বীপরূপে চিহ্নিত করেছেন। নবদ্বীপের কাছে ভাগীরথীর পূর্বতীরে, বামনপুকুর গ্রামে একটি সুউচ্চ ও সুপ্রশস্ত ঢিবি বর্তমানে বল্লাল ঢিবি নামে পরিচিত। অনেকে মনে করেন, বল্লালসেনের রাজপ্রাসাদের ধ্বংসাবশেষ এই ঢিবিতে পরিণত হয়েছে। ...এসব তথ্য ও লোকশ্রুতি থেকে অনুমিত হয় যে নবদ্বীপ ও সংলগ্ন অঞ্চলেই সেন রাজাদের রাজধানী ছিল।"[৮]

কিন্তু কবি ধোয়ীতো গঙ্গা ও জলঙ্গী নদীর সঙ্গমস্থলের কথা কোথাও বলেননি তাঁর 'পবনদূত'-এ। তিনি তো বিজয়পুরের অবস্থান দেখিয়েছেন গঙ্গা ও যমুনার সঙ্গমস্থলে। তাহলে মোহিত রায় মহাশয় গঙ্গা ও জলঙ্গী নদীর

সঙ্গমস্থলের উল্লেখ করলেন কিভাবে। তাছাড়া 'বল্লালঢিবি' নামক সুউচ্চ ঢিবি প্রত্নস্থলটি দেখেই কি নিশ্চিতভাবে, কোন প্রত্নতাত্ত্বিক উৎখনন না করে, বলা চলে যে এখানেই সেন রাজাদের রাজপ্রাসাদের ধ্বংসাবশেষ মৃত্তিকাগর্ভে আচ্ছাদিত। তখনও পর্যন্ত কি কোন প্রত্নউৎখনন হয়েছিল বল্লালঢিবিতে, বা কোন প্রত্নতাত্ত্বিক আবিষ্কার ঘটেছিল এখান থেকে, যার উপর ভিত্তি করে বলা চলে যে এখানেই ছিল সেন রাজাদের রাজপ্রাসাদ। এ প্রসঙ্গে একটু পরেই আসা যাবে।

১৯৯৭ খ্রীষ্টাব্দে যজ্ঞেশ্বর চৌধুরী প্রাচীন বিজয়পুর রাজধানীর বর্তমান ভৌগোলিক অবস্থান প্রসঙ্গে বললেন "বিজয়পুরের অবস্থান নির্ণয় প্রসঙ্গে বিখ্যাত ও লব্ধ প্রতিষ্ঠিত ঐতিহাসিকগণের মন্তব্য হতে জানা যায় যে বিজয়পুর ও নদীয়া বা নবদ্বীপ এক ও অভিন্ন। বর্তমানকালের প্রেক্ষাপটে পবনদূতের বর্ণনার সঙ্গে তুলনা করলে দেখা যায় যে বিজয়পুর প্রাচীন ব্রহ্ম জনপদের (মতান্তরে সুহ্ম) মধ্যে অবস্থিত ছিল। বিজয়পুর বা নবদ্বীপ প্রথমাবধি গঙ্গা/ভাগীরথী/সুরনদী বা জাহ্নবীর তীরে অবস্থিত এবং ত্রিবেণী হতে নবদ্বীপের দূরত্ব মাত্র ৫৭ কিলোমিটার। ...বিজয়পুর ও নবদ্বীপ যে অতীতকালে এক এবং অভিন্ন ছিল তা নির্ণয় করার একমাত্র পথ হল বল্লাল ঢিবি, সুবর্ণ বিহার ও বর্তমান নবদ্বীপের উত্তরাংশ উৎখননের দ্বারা। যদি ভবিষ্যতে উৎখনন করা সম্ভবপর হয় তাহলে বিজয়পুরসহ এই অঞ্চলের বহু অজ্ঞাত ও বিলুপ্ত তথ্যের সন্ধান পাওয়া যাবে এবং নবদ্বীপ অঞ্চলের প্রকৃত ইতিহাস রচনা করা সম্ভবপর হবে, সে বিষয়ে কোন সন্দেহ নাই।"[৯]

উপরের আলোচনা থেকে দেখা গেল যে সেনরাজধানী বিজয়পুরের বর্তমান ভৌগোলিক স্থিতি আলোচনা করতে গিয়ে গবেষকমহল দ্বিধা বিভক্ত। একদল দৃষ্টি নিক্ষেপ করেছেন নবদ্বীপ—নদীয়ার দিকে। আর অন্যদল রাজশাহী জেলার বিজয়নগরের দিকে। বলতে দ্বিধা নেই যে, যাঁরা নবদ্বীপ-নদীয়াকে সেন রাজধানী বিজয়পুরের সঙ্গে সনাক্ত করতে চেয়েছেন তাঁদের এই সনাক্তকরণের ভিত্তি ছিল নবদ্বীপের 'বল্লালঢিবি' নামক প্রত্নস্থল এবং মিনহাজউদ্দিন সিরাজের 'তবকাৎ-ই-নাসিরি'-র বর্ণনা। মিনহাজউদ্দিনের আলোচনা প্রসঙ্গে পরে আসা যাবে। আপাততঃ এই মুহূর্তে 'বল্লালঢিবি'র প্রসঙ্গ আলোচনা করা যাক।

যাঁরা নবদ্বীপ-নদীয়াকে প্রাচীন বিজয়পুরের সঙ্গে সনাক্ত করতে চেয়েছেন তাঁদের সকলেরই ধারণা ছিল যে 'বল্লালঢিবি' নামক প্রত্নস্থলই সেনরাজধানী বিজয়পুরের ধ্বংসাবশেষ। অর্থাৎ এই স্থানেই রাজধানী বিজয়পুরের আবিষ্কার সম্ভব। উপরন্তু স্থানটি গঙ্গানদীর তীরে অবস্থিত। তাই তাঁরা কোন চিন্তা ভাবনা না করেই তাঁদের মতামত দিয়ে গেছেন। কিন্তু তাঁদের সেই মতামত যে অনৈতিহাসিক, ভিত্তিহীন, তাঁদের অভিমত যে শুধুই মনগড়া তা বোঝা গেল ভারতীয় প্রত্নতত্ত্ব সর্বেক্ষণ (Archaeological Survey of India)-এর 'বল্লালঢিবি' নামক প্রত্নস্থলটির বৈজ্ঞানিক পদ্ধতিতে উৎখননের ফলে। 'বল্লালঢিবি' নামক প্রত্নস্থলে প্রত্নউৎখনন করে ভারতীয় প্রত্নতাত্ত্বিক সর্বেক্ষণ তাদের বাৎসরিক প্রতিবেদনে (১৯৮৩-৮৪) যা বলেছেন তা হল :

"Excavation at Ballal Dhipi, District Nadia...... This season's work was mainly centered round the northern and western sides of the mound. It was observed that the exposed structured which was believed earlier to represent a religious edifice was in all likelihood a *pancharatha* temple located within a walled enclosure. It consisted of an outer wall in *pancharatha* style, the width of which was 1.90m, built of brick, the size of which varied between 20×16×4 cm. and 24×19×5 cm. the common size being 20×16×4 cm. ...A number of copper objects found on the floor meant for probably some religious purpose. The objects included spouted lotus, lamps, laddle and a number of cylindrical cases, the use of which in all probability was for keeping valuable records."[১০]

১৯৮৬-৮৭ সালের ভারতীয় প্রত্নতত্ত্ব সর্বেক্ষণের বাৎসরিক প্রতিবেদনেও 'বল্লালঢিবি'-র উৎখনন প্রসঙ্গে বলা হল :

"Excavation at Ballal Dhipi, District Nadia... the gateway of the main shrine and to know the working level of the sanctum of the temple. The exposed eastern wall in north-south orientation though badly damaged due to several brick robbings and other natural phenomena have been traced successfully. Though the exposed wall here followed a more or less uniform line, the width varied in each trench from 4.00 m to 2.39m but the southern wall (running in east-west direction) was uniformly 3.70 m in width.

The bricks used in the inner enclosing wall were of different sizes, the measurement ranging from 22 cm × 8 cm to 14 cm × 18 cm and the thickness from 4 cm to 3 cm. Such slight deviation from the bricks exposed earlier suggest different phases of the wall.’’[১১]

যাঁরা এতদিন ‘বল্লালঢিবি’ দেখে, কোন বিচার বিবেচনা না করে, এটিকে সেনরাজাদের রাজপ্রাসাদের ধ্বংসাবশেষ বলে সিদ্ধান্ত করেছেন এবং সেই সূত্রে নবদ্বীপ-নদীয়াকে প্রাচীন বিজয়পুর বলে সনাক্ত করেছেন, তাঁরা ভারতীয় প্রত্নতত্ত্ব সর্বেক্ষণের উৎখনন প্রতিবেদন দেখে কি মনে করবেন? যাইহোক, ‘বল্লালঢিবি’ নামক প্রত্নস্থলটি যে আসলে একটি ধর্মীয় সৌধের ধ্বংসাবশেষ তা বোঝা গেল। এবার আসা যাক মিনহাজউদ্দিন সিরাজের তবকাৎ-ই নাসিরীর আলোচনা প্রসঙ্গে।

মিনহাজউদ্দিনের নদীয়াজয়ের কাহিনী প্রসঙ্গে ঐতিহাসিক রমেশচন্দ্র মজুমদার বলেছেন — “মীনহাজুদ্দিনের নদীয়া অভিযান কাহিনী সম্পূর্ণরূপে সত্য বলিয়া গ্রহণ করা কঠিন। যে বিশ্বাসী লোকেরা তাঁহাকে সংবাদ যোগাইয়াছিল তাহাদের জ্ঞান ও বুদ্ধি কতদূর ছিল, তাহা লক্ষ্মণসেনের অদ্ভুত জন্মবিবরণ ও তাঁহার ৮০ বৎসর রাজত্বের কথা হইতেই বুঝা যায়। বিশেষতঃ এই কাহিনীর মধ্যে অনেক সুপরিচিত প্রবাদ, কথা ও অবিশ্বাস্য ঘটনার সমাবেশ আছে। ‘তুরস্ক আক্রমণ সম্বন্ধেও হিন্দুর শাস্ত্রবাণী’ চচ্‌নামা নামক গ্রন্থে সিন্ধুদেশ সম্বন্ধেও উল্লিখিত হইয়াছে। এই শাস্ত্রবাণীর মূল্য যাহাই হউক, ইহাতে প্রমাণিত হয় যে নদীয়া আক্রমণের অন্তত এক বৎসর পূর্বে ইহার সম্ভাবনা রাজকর্মচারীরা জ্ঞাত ছিলেন। অথচ বখতিয়ার বিহার হইতে নদীয়া পৌঁছিলেন, ইহার মধ্যে তাঁহার অভিযানের কোন সংবাদ যেন রাজদরবারে পৌঁছিল না। যে সময় তুরস্কসেনা কর্তৃক দেশ আক্রান্ত হইবার পূর্ণ সম্ভাবনা বিদ্যমান, সেই সময় রাজধানীর দ্বাররক্ষীরা ১৮ জন অশ্বারোহী তুর্কীকে বিনা বাধায় নগরে প্রবেশ করিতে দিল এবং অস্ত্রশস্ত্রে সুসজ্জিত বর্মাবৃত সৈন্যকে অশ্বব্যবসায়ী বলিয়া ভুল করিল; নগর রক্ষীরা কোন সন্দেহ করিল না এবং বখতিয়ার বিনা বাধায় রাজপ্রাসাদের তোরণ পর্যন্ত পৌঁছিলেন। যখন বখতিয়ারের অবশিষ্ট সৈন্যদল নগরে প্রবেশ করিল, তখনও এই অগ্রগামী ১৮ জন অশ্বারোহীকে সন্দেহ করিয়া কেহ তাহাদের গতি প্রতিরোধ করিতে অগ্রসর হইল না। রাজার দেহরক্ষী বা সৈন্যদল অবশ্যই ছিল। যখন রাজা স্বয়ং নদীয়াতে ছিলেন, তখন অন্তত একদল রাজসৈন্য নিশ্চয়ই তাঁহার রাজকার্যে নিযুক্ত ছিল, অথচ বখতিয়ারের সৈন্যদলের কাহারও গায়ে একটি আঁচড় লাগিল না, তাহারা স্বচ্ছন্দে বিনা বাধায় হত্যাকান্ড ও লুণ্ঠনকার্য চালাইতে লাগিল। এ সমুদয় এতই অস্বাভাবিক যে, খুব দৃঢ় বিশ্বাসযোগ্য প্রমাণ ব্যতীত সত্য বলিয়া স্বীকার করা অসম্ভব।”[১২]

মিনহাজউদ্দিনের বর্ণনার কোন ঐতিহাসিক ভিত্তি যে নেই তা দীর্ঘকাল ধরে অসংখ্য ঐতিহাসিক গভীর সন্দেহ পোষণ করে এসেছেন। আর যাঁরা নবদ্বীপ-নদীয়াকে প্রাচীন বিজয়পুর রাজধানী বলে মত প্রকাশ করে এসেছেন তাঁদের সেই মতের ভিত্তি ছিল একমাত্র বল্লালঢিবি নামক প্রত্নস্থলটি। উৎখননের আগে পর্যন্ত অনেকেরই ধারণা ছিল যে, যেহেতু ঢিবিটির আদ্যপদে বল্লাল শব্দযুক্ত সেই হেতু এই বল্লাল নিঃসন্দেহে সেনরাজ, বল্লালসেন। অতএব তাঁরা ধরেই নিয়েছিলেন যে এখানেই পাওয়া যাবে সেনরাজাদের রাজপুরের ধ্বংসাবশেষ। আর তাই বর্তমান নবদ্বীপ-নদীয়া অঞ্চলই সেই, প্রাচীন বিজয়পুর। শুধু তাই নয় নিকটবর্ত্তী স্থানে ‘বল্লালদীঘি’ নামে এক প্রকান্ড দীঘির অবস্থানও বেশ কৌতুহলের বিষয় হয়ে দাঁড়িয়েছিল। কিন্তু সাম্প্রতিককালে ভারতীয় প্রত্নতত্ত্ব সর্বেক্ষণের বল্লালঢিবিতে উৎখনন তাঁদের সেই মতামত যে অসার ও ভিত্তিহীন তা প্রমাণ করল। ‘বল্লালঢিবি’র অবস্থান ছাড়াও যাঁরা প্রাচীন বিজয়পুরকে নবদ্বীপ-নদীয়ার সঙ্গে সনাক্ত করতে চেয়েছেন, তাঁদের মতামতের মধ্যে অনেক অসঙ্গতিও লক্ষ্য করা যায়। কবি ধোয়ী তো সুস্পষ্ট ভাষায় ইঙ্গিত দিয়ে গেছেন যে রাজধানী বিজয়পুরের অবস্থান গঙ্গা ও যমুনা নদীর সঙ্গমস্থলে

অবস্থিত ত্রিবেণীর অদূরেই। অথচ বর্তমান নবদ্বীপ-নদীয়ার কাছে গঙ্গা ও যমুনা নদীর সঙ্গমস্থলও নেই, বা যমুনা নদীও নেই। তাহলে পূর্ববর্তী লেখকরা কিসের ভিত্তিতে এই সিদ্ধান্ত করলেন সেই প্রশ্ন বারবার ঘুরে-ফিরে আসে।

তাহলে প্রশ্ন উঠবে প্রাচীন বিজয়পুর রাজধানীর ভৌগোলিক অবস্থান কোথায়? প্রাচীন রাজধানী বিজয়পুরকে অনুসন্ধান করার আগে আমাদের খুঁজে দেখতে হবে গঙ্গা ও যমুনা নদীর সঙ্গমস্থল কোথায়? গঙ্গা-যমুনার সঙ্গমস্থলে অবস্থিত ত্রিবেণী কোথায়? আর সেই ত্রিবেণীর অদূরেই বিজয়পুর। এই কয়েকটি সূত্র ধরে বিজয়পুরের অনুসন্ধানে অগ্রসর হওয়া যাক।

চিরতুষারাবৃত হিমালয়ের গঙ্গোত্রী হিমবাহ থেকে উৎপন্ন হয়ে গঙ্গা নদী তার প্রবাহ পথে উত্তর প্রদেশের প্রয়াগের কাছে যমুনা ও সরস্বতীকে সঙ্গী করেছে। অর্থাৎ প্রয়াগের কাছে এই তিনটি নদী একসঙ্গে মিলিত হওয়ায় এই স্থানের নাম হয়েছে 'ত্রিবেণী'। আর তিনটি নদী একই ধারায় যুক্ত হওয়ায় এই ত্রিবেণীকে বলা হয় 'যুক্তবেণী'। এখান থেকে গঙ্গা, যমুনা ও সরস্বতীকে সঙ্গে নিয়ে বারাণসী, গাজীপুর হয়ে এসে পৌঁছেছে বর্তমান বিহার রাজ্যের রাজধানী পাটনা (প্রাচীন পাটলিপুত্র) নগরীতে। পাটনা থেকে গঙ্গা ক্রমশঃ পূর্বে প্রবাহিত হয়ে, রাজমহল পাহাড় ছেড়ে, তেলিগড়-সিক্রিগলির সংকীর্ণ গিরিবর্ত্ম দিয়ে বাংলায় প্রবেশ করে, মালদহ ও মুর্শিদাবাদ জেলা ছেড়ে, নদীয়া জেলা ভেদ করে এসে পৌঁছেছে, বর্তমান হুগলী জেলার প্রাচীন স্থান 'ত্রিবেণী'-তে। এই স্থানে এসে যমুনা ও সরস্বতী পুনরায় গঙ্গা থেকে মুক্ত হয়ে নিজ নিজ প্রবাহপথে অগ্রসর হয়েছে। তাই অনেক অতীত থেকেই হুগলীর এই ত্রিবেণী 'মুক্তবেণী' নামে খ্যাত হয়ে আছে। এখান থেকে গঙ্গা বামদিকে যমুনাকে এবং ডানদিকে সরস্বতীকে ছেড়ে স্বতন্ত্র ধারায় সাগর সঙ্গমের দিকে প্রবাহিত হয়েছে। গঙ্গা-যমুনা-সরস্বতী-এই তিন নদীর মুক্তস্থলই ত্রিবেণী বা 'মুক্তবেণী'। এই ত্রিবেণী-ই কবি ধোয়ীর পবনদূত কাব্যে বর্ণিত ত্রিবেণী। আর ত্রিবেণীর পূর্বপ্রান্তেই অবস্থিত গঙ্গা ও যমুনার সঙ্গমস্থল।

বহু প্রাচীনকাল থেকেই ত্রিবেণী-র খ্যাতি ও প্রতিপত্তির কথা শোনা যায়। ২৩-৭৯ খ্রীষ্টাব্দে অর্থাৎ খ্রীষ্টীয় প্রথম শতকে রোমান ঐতিহাসিক প্লিনি রোমের সঙ্গে ভারতের বাণিজ্য প্রসঙ্গে এই ত্রিবেণীর কথা বলেছেন—"the ships assembling near the Godavari Sailed from thence to cape palinurus, thence to Tentigale opposite Fulta, thence to Tribani and lastly to Patna."[১৩] খ্রীষ্টীয় দশম থেকে দ্বাদশ শতাব্দীর মধ্যে রচিত 'বৃহদ্ধর্ম পুরাণ'-এ আমরা যমুনা নদীর সবিশেষ পরিচয় পাই। আবার দ্বাদশ শতকে রচিত গোবর্ধন আচার্যের 'আর্যাসপ্তসতী'-র পাতায় পাতায় যমুনার উল্লেখ, যমুনার খ্যাতি ও যমুনার তীর্থ মহিমা আমাদের বেশ আশ্চর্য করে তোলে।[১৪] আবার খ্রীষ্টীয় একাদশ শতকে রচিত বাংলা সাহিত্যের প্রাচীনতম নিদর্শন 'চর্যাপদ' নামক গ্রন্থেও আমরা গঙ্গার সঙ্গে যমুনার এক প্রাঞ্জল বিবরণ পাই।[১৫]

কবি ধোয়ী বর্ণিত গঙ্গা-যমুনার সঙ্গমস্থল ও সেই সঙ্গমস্থলে অবস্থিত ত্রিবেণীকে খুঁজে পাওয়া গেল। পাল-সেন আমলে এই ত্রিবেণীতে যে একটি সুসমৃদ্ধ জনপদ গড়ে উঠেছিল তার প্রত্নতাত্ত্বিক প্রমাণ সুপ্রচুর। প্রসঙ্গক্রমে ত্রিবেণীর জাফর খাঁ মসজিদ ও সৌধ সম্বন্ধে প্রত্নতত্ত্ববিদ ব্লকম্যান (Blochmann) কি বলেছেন তা দেখা যাক—
The astanah consists of two enclosures. The first, which lies near the road leading along the bank of the Hugli, is built of large basalt stones, said to have taken from an old Hindu temple, which Zafar Khan destroyed. Its east wall, which faces the river, shows clear traces of multilated Hindu idols and dragons and fixed into it, at a height of about Six feet from the ground, is a piece of iron, said to be the handle of Zafar Khan's battle-axe. The second enclosure, which is joined to the west wall of the first, is built of sandstone. The Khadim or keeper of the astanah, a man not alltogether illiterate, told me that the western tomb was that of Zafar Khan. The other three, he said are those of Ain Khan Ghazi and Ghain Khan Ghazi, sons of Zafar Khan and of the wife of Bar Khan Ghazi, third son of Zafar Khan, and of Rahim Khan Ghazi, and Karim Khan Ghazi, sons of Bar Khan.

About twenty yards to the west of the second enclosure are the ruins of a mosque, likewise built with the materials of an old Hindu temple. The low basalt pillars supporting the arches are unusually thick, and the domes are built of successive rings of masonary, the diameter of each layer being somewhat less than that of the layer below, the whole being somewhat less than that of the layer below, the whole being copped by a circular stone, covering the small remaining aperture. This of the domes are broken; on the western wall there are several inscriptions. According to the Arabic verses written about the principal miharb, the mosque was built by Khan Muhammadan Zafar Khan, who is called a Turk, in A.H. 698, or A.D. 1298. The ground round about the mosque is very uneven; several basalt pillers lie about; and there are foundations of several stuctures, as also a few tombs, which are said to be the resting places of former Khadims.''[১৬]

এই রকম আরো কত-শত প্রত্নকীর্ত্তি যে কালের গর্ভে বিলীন হয়ে গেছে তার কোন হিসেব-নিকেশ নেই। তবে সুদুর প্রাচীনকাল থেকেই যে ত্রিবেণীতে সমৃদ্ধ ধর্মীয় ও বাণিজ্যিক জনপদ গড়ে উঠেছিল তাতো ঐতিহাসিক ভাবেই সত্য।

কবি ধোয়ী তাঁর পবনদূতে বলেছেন ত্রিবেণীর অদূরে, গঙ্গা-যমুনার সঙ্গমস্থলেই অবস্থিত সেন রাজধানী বিজয়পুর। বর্তমানকালে, প্রশাসনিক বিভাগ অনুযায়ী ত্রিবেণী পশ্চিমবঙ্গ রাজ্যের হুগলী জেলায় অবস্থিত। এই ত্রিবেণীর পূর্বদিকে গঙ্গা বা ভাগীরথী নদী। অর্থাৎ গঙ্গা-ভাগীরথীর পশ্চিমে অবস্থিত হুগলী জেলা ও ত্রিবেণী জনপদ। আর এই গঙ্গা-ভাগীরথীর পূর্বে, ত্রিবেণীর বিপরীতে, কিছুটা উত্তরাংশে অবস্থিত গঙ্গা-যমুনার সঙ্গমস্থল। গঙ্গা থেকে মুক্ত হয়ে যমুনা ক্রমশঃ পূর্বদিকে প্রবাহিত হয়েছে, বর্তমান পশ্চিমবঙ্গ রাজ্যের নদীয়া ও উত্তর ২৪ পরগনা জেলার সীমানা রচনা করে। অর্থাৎ নদীয়া' জেলার দক্ষিণ-পশ্চিম এবং উত্তর ২৪ পরগনা জেলার উত্তর-পশ্চিম সীমান্ত রচনা করে বর্তমানে 'বাঘের খাল' নাম নিয়ে (!) ক্রমশঃ পূর্বদিকে প্রবাহিত হয়েছে।[১৭] আর যমুনা যেখানে সঙ্গমস্থল থেকে গঙ্গাকে ছেড়ে মুক্ত প্রবাহে প্রবাহিত হয়েছে সেই প্রবাহিত খাতের উত্তরে নদীয়া জেলার কল্যাণী এবং দক্ষিণে, সঙ্গমস্থলের সন্নিকটে, বর্তমান উত্তর ২৪ পরগনা নামক জেলার 'বিজপুর"।[১৮] আমার সুদৃঢ় অভিমত গঙ্গা-যমুনার সঙ্গমস্থলের নিকটবর্তী; ত্রিবেণীর পরপারে অবস্থিত, উত্তর ২৪ পরগনার বিজপুর-ই কবি ধোয়ীর পবনদূতে বর্ণিত বিজয়পুর এর স্মৃতি হিসাবে টিকে আছে।

কবি ধোয়ী তাঁর 'পবনদূত'-এ বিজয়পুর রাজধানী-র প্রসঙ্গ আলোচনা করতে গিয়ে বলেছেন যে, রাজধানী বিজয়পুর গঙ্গা ও যমুনা নদীর সঙ্গমস্থলে অবস্থিত। আর আজকের উত্তর ২৪ পরগনা জেলার 'বিজপুর' জনপদটিও গঙ্গা-ও যমুনা নদীর সঙ্গমস্থলে অবস্থিত। দ্বিতীয়তঃ কবি ধোয়ী বলেছেন যে রাজধানী বিজয়পুরের দূরত্ব ত্রিবেণী থেকে বেশী দুরে নয়। আজকের উত্তর ২৪ পরগনা জেলার বিজপুরের দূরত্বও ত্রিবেণী থেকে খুব বেশি নয়। ত্রিবেণী ঘাট থেকে খেয়ানৌকায় ভাগীরথীর পরপারেই পৌঁছানো যাবে 'বিজপুর' জনপদে। তৃতীয়তঃ কবি ধোয়ী বলেছেন যে বিজয়পুরের সুউচ্চ দেউলে ভগবান মুরারী ও মহাদেব অধিষ্ঠিত আছেন। এখন এই বিষয়টি নিয়ে একটু আলোচনা করা যাক।

আমাদের মনে রাখা দরকার যে কবি ধোয়ী যে সময়ে তাঁর 'পবনদুত'-এ রাজধানী বিজয়পুরের কথা লিখেছেন সে সময় বর্তমানকালের মতো নদীয়া, উত্তর ২৪ পরগনা, দক্ষিণ ২৪ পরগনা বা হুগলী জেলা নামে কোন জনপদ ছিল না। সেকালের জনপদ ছিল সুক্ষ্ম, ব্রহ্ম, রাঢ়, দক্ষিণ-রাঢ় প্রভৃতি কত নাম নিয়ে। প্রশাসনিক কারণেই বর্তমানকালে বিভিন্ন জেলা, মহকুমা বা থানা এলাকার সৃষ্টি হয়েছে বা এখনও হচ্ছে। তাই সেকালের বিজয়পুর রাজধানীর সীমানা কতদুর ছিল তা বলা যায় না। পবনদূতে বলা হয়েছে বিজয়পুরের সুউচ্চ দেউলে ভগবান মুরারী এবং মহাদেব অধিষ্ঠিত আছেন। ভগবান মুরারী বলতে বোঝান হয়েছে ভগবান কৃষ্ণকে[১৯] আর মহাদেব বলতে বোঝান হয়েছে দেবাদিদেব শিবকে। বর্তমান উত্তর ২৪ পরগনার বিজপুরের কিছুটা উত্তরে যমুনা নদীর উত্তর তীরে, নদীয়া জেলাব

কল্যাণী থানা এলাকার কাঞ্চনপল্লীতে বহু শতকের প্রাচীন কৃষ্ণরায় এবং এই থানা এলাকার কুলিয়ার কষ্টিপাথরের কৃষ্ণ, অষ্টধাতুর রাধিকা প্রভৃতি বিগ্রহ এবং শালগ্রামশিলা দামোদর প্রভৃতি প্রাচীন যমুনা নদীর তীরে ধর্মস্থান গড়ে ওঠার পাথুরে প্রমাণ।[২০] প্রাচীন যমুনা তীরে অবস্থিত, নদীয়ার হরিণঘাটা থানা এলাকার বিরহী আর এক প্রাচীন স্থান। স্থানটি শতাধিক বছরের প্রাচীন একটি দালান মন্দিরে কাঠের মদনগোপাল, রাধিকা, বলরাম, রেবতী ও জগন্নাথের মূর্তি এবং পাথরের একটি শিবলিঙ্গ দেখা যায়। বর্তমান মন্দিরটি খুব বেশী প্রাচীন না হলেও মন্দির সংলগ্ন স্থানটি যে কয়েক শতকের প্রাচীন তা অসংখ্য ভাঙা ইট ও মৃৎপাত্রের অংশ, যেগুলি ছড়িয়ে-ছিটিয়ে পড়ে আছে, দেখলেই বোঝা যায়।[২১] এই স্থানে, বট গাছের নীচে, একটি পাথরের খণ্ডিত অংশ পড়ে থাকতে দেখা যায়—যেটি কোন ধর্মীয় সৌধের ভগ্নাংশ বলে মনে হয়। স্থানটিতে প্রত্নতাত্ত্বিক খননকার্য করা প্রয়োজন। যমুনা তীরবর্তী, উত্তর ২৪ পরগনার গাইঘাটা থানার ইছাপুর গ্রামেও গোবিন্দজীউ-এর ধ্বংসপ্রাপ্ত নবরত্ন মন্দিরটি এখানে অতীতে ধর্মীয় কেন্দ্র গড়ে ওঠার ইঙ্গিতবাহী।[২২]

সব মিলিয়ে, প্রাচীন যমুনা নদীর দুই তীরবর্তী অসংখ্যস্থানে যে একাধিক ধর্মকেন্দ্র গড়ে উঠেছিল তা বলা বাহুল্য। বস্তুতঃ সেনরাজারা, এমনকি স্বয়ং লক্ষ্মণসেন ছিলেন পরম বৈষ্ণব। বলা বাহুল্য লক্ষ্মণ সেনের এই বৈষ্ণব প্রীতি সমসাময়িককালের সাহিত্যেও এসে পড়েছে। "ধোয়ীই হউন আর শ্রীধর দাসই হউন, জয়দেবই হউন আর উমাপতিধরই হউন, সকলেই লক্ষ্মণসেনের স্তুতি যখন গাহিয়াছেন তখন অনিবার্যভাবেই যেন তাঁহার তুলনা করিয়াছেন কৃষ্ণের সঙ্গে এবং সে কৃষ্ণ মহাভারতের শ্রীকৃষ্ণ নহেন, মথুরা-বৃন্দাবনের রাধালীলাসহচর কৃষ্ণ। ...যেখানে লক্ষ্মণসেন সেখানেই কেলী তাহা রাজকীয় লিপিতেই হউক, বা কবির স্তুতিতেই হউক। এ তথ্যের ঐতিহাসিক ইঙ্গিত অবহেলার বস্তু নয়। দ্বিতীয়ত; শ্রী হর্ষের নৈষধচরিত বা ধোয়ীর পবনদূত, জয়দেবের গীতগোবিন্দ বা গোবর্ধনের সপ্তশতী সর্বত্রই যেন শৃঙ্গার রসের প্রাবল্য একটু বেশি, কামলালসাময় ভাবনা কল্পনার দিকে আকর্ষণ প্রবল, রুচি তরল এবং ইন্দ্রিয়বিলাসী। সাহিত্যের এই চিত্র সাধারণভাবে সমসাময়িক সমাজের প্রতিফলন, সন্দেহ কি, এবং এই সমাজ রাজসভাপুষ্ট অভিজাত সমাজ। ...সেন রাজসভায় এবং সমসাময়িক অভিজাত স্তরে সেই রসই কামদহনে মদ্যের পর্যায়ে উন্নীত হয়েছে।"[২২]

তাই যে রাজা (লক্ষ্মণ সেন) নিজে পরম বৈষ্ণব, যে রাজা কৃষ্ণ-রাধিকার পরম উপাসক, যে রাজার সঙ্গে কেলি-লীলা অঙ্গাঙ্গিভাবে জড়িত সেই রাজা যে রাজধানীর আসে পাশে রাধাকৃষ্ণের উপাসনা স্থল গড়ে তুলবেন তাতে আর সন্দেহ কি। যমুনা তীরে মথুরা, বৃন্দাবনসহ অন্যান্য রাধাকৃষ্ণের লীলাস্থলের মত বাংলার যমুনাতীরেও তাই দেখা যায় অসংখ্য রাধাকৃষ্ণের উপাসনাস্থল। তাই রাজধানী বিজয়পুরের স্মৃতি হিসাবে আজও যেমন টিকে আছে গঙ্গা-যমুনার সঙ্গমস্থলে, ত্রিবেণীর পরপারে অবস্থিত আজকের 'বিজপুর' (জেলা - উত্তর ২৪ পরগনা), ঠিক তেমনই টিকে আছে সেকালের যমুনার তীরে গড়ে ওঠা রাধা-কৃষ্ণের লীলাস্থলগুলিও।

তথ্যপঞ্জী :

১। হরপ্রসাদ শাস্ত্রী—ধোয়ী কবির পবনদূত, ১৩০৫ বঙ্গাব্দ।

২। Monomohan Chakraborti—Notes on Geography of Old Bengal, 1908.

৩। সতীশ চন্দ্র মিত্র—যশোর-খুলনার ইতিহাস, ১৯১৪।

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৮। মোহিত রায়—নদীয়া জেলার পুরাকীর্তি, ১৯৭৫।

৯। যজ্ঞেশ্বর চৌধুরী—একটি বিলুপ্ত রাজধানী (বিজয়পুর) ১৯৯৭।

১০। M.S. Nagaraja Rao (Ed.)—Indian Archaeology, 1983-84, A Review, 1986.

১১। M.C. Joshi (Ed.)—Indian Archaeology, 1986-87, A Review, 1992.

১২। রমেশচন্দ্র মজুমদার— পূর্বোক্ত।

১৩। W.W. Hunter—A Statistical Account of Bengal, Vol. III, 1997 (প্রথম প্রকাশ ১৮৭৬)।

১৪। গোবর্ধন আচার্য—আর্যাসপ্তশতী (মূল ও সটীক বঙ্গানুবাদ), অনুবাদক — জাহ্নবী কুমার চক্রবর্ত্তী, ১৯৭১।

১৫। হরপ্রসাদ শাস্ত্রী—হাজার বছরের পুরানো বাঙ্গালা ভাষায় বৌদ্ধগান ও দোঁহা, ১৩২৩ বঙ্গাব্দ।

১৬। W.W. Hunter—পূর্বোক্ত।

১৭। তপন কুমার দাস—যমুনা অববাহিকার ইতিহাস ও সংস্কৃতি (অপ্রকাশিত পাণ্ডুলিপি)।

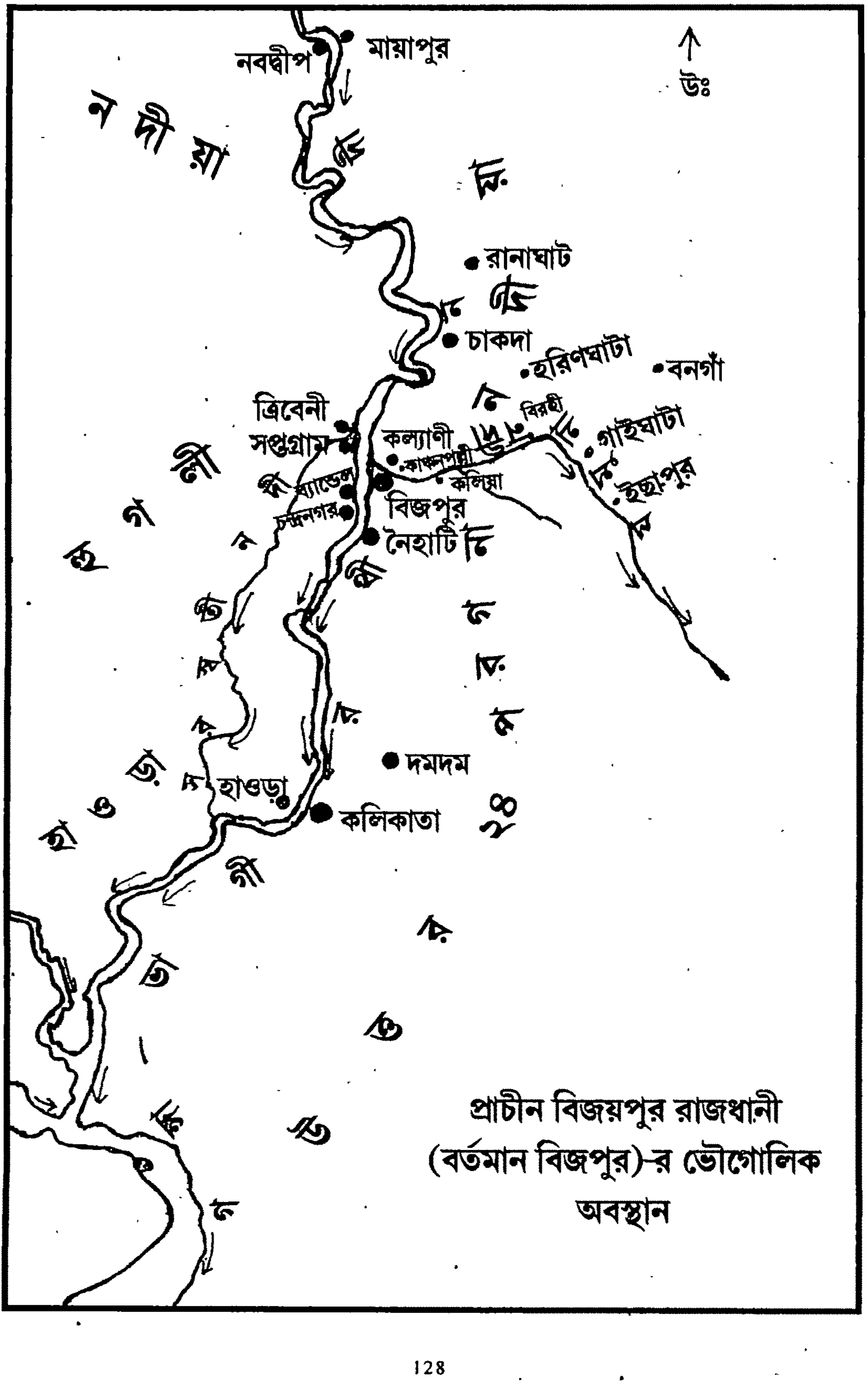
১৮। ঐ—ঐ।

১৯। রাজশেখর বসু—চলন্তিকা, ১৩৮০ বঙ্গাব্দ।

২০। তপন কুমার দাস—পূর্বোক্ত।

২১। ঐ—ঐ।

২২। নীহাররঞ্জন রায়—পূর্বোক্ত।



প্রাচীন বিজয়পুর রাজধানী (বর্তমান বিজপুর)-র ভৌগোলিক অবস্থান

দক্ষিণ ২৪ পরগনার কাঠের কাজ

*সঞ্জিত জোতদার **

সভ্যতার ক্রমবিবর্তনে মানুষের দ্বিতীয় বড় আবিষ্কার হল, গাছের গুঁড়ি গড়িয়ে চাকা আবিষ্কার। একই সঙ্গে গাছের গুঁড়ি জলে ভাসিয়ে প্রথম জলযানের সূচনা ঘটেছিল। একদিকে শুকনো কাঠ জ্বালানি হিসেবে ব্যবহৃত হয়েছে এবং সভ্যতার অগ্রগতির সঙ্গে প্রকৃতির প্রতিকূলতা কাটাতে সাহায্য করেছে। অন্যদিকে গাছের ফলমূল খেয়ে মানুষ জীবন ধারন করেছে। গাছ দিয়েছে আশ্রয়, সর্বোপরি লজ্জা নিবারণের প্রথম আচ্ছাদন। সভ্যতার প্রথম পর্ব থেকেই মানুষ যেমন গাছের কাছে ঋণী, ঠিক তেমনি আবার গাছের প্রধান শত্রুর ভূমিকাও নিয়েছে এই মানুষ।

বাঙালি শিল্পীর কাঠের কাজের সুখ্যাতি বহুদিনের। প্রাচীন নিদর্শনের অভাবে বাংলার কাঠের কাজের লৌকিক ও অভিজাতক্রম অনুধাবন করা খুবই কষ্টকর। প্রাচীন কাব্যগুলিতে কাঠের কাজের উল্লেখ থেকে লোকজীবনের সঙ্গে কাঠের নিবিড় যোগসূত্র পরিলক্ষিত করা যায়।

সূত্রধর বা ছুতোরেরা প্রধানত কারুশিল্প বা কাঠের কাজ করেন। কাঠের কাজের লৌকিক ও অভিজাত উভয় ধারারই স্রষ্টা সূত্রধর সম্প্রদায়। তবে তাদের প্রথম কাজ ছিল ঘর বানানো। সেজন্য বাংলার একচালা, দোচালা, চৌচালা আর আটচালা ঘরের পরিচয় সারা পৃথিবী জুড়ে গৃহীত হয়েছে। দক্ষিণ ২৪ পরগনায় অনেক বর্ণের মানুষ কাঠের কাজ করেন। যেমন—মাহিষ্য, পৌণ্ড্রক্ষত্রিয়, কৈবর্ত, কাওরা, সদগোপ প্রভৃতি। এছাড়া মুসলমান সম্প্রদায়েরও কিছু অংশ এই কাঠের কাজে লিপ্ত।

বংশ-পরম্পরায় সংস্কৃতিমনস্ক ও অভিজাত সম্প্রদায়ের মানুষেরা কাঠের আসবাবপত্র ও নানান শখের জিনিস যত্নে রেখেছেন। দক্ষিণ ২৪ পরগনার বিভিন্ন প্রান্তে কাঠের কাজের প্রাপ্ত নানান দ্রব্য থেকে সরাসরি সামাজিক জীবনে দারুশিল্পের ধারা প্রবহমান ছিল বলা যায়।

একটুকরো কাঠ পাওয়ার পর শিল্পীকে ভাবতে হয় অনেক কিছুই। কাঠের বৈশিষ্ট্য সম্যকভাবে জানা একান্ত প্রয়োজন কারণ সব কাঠে সব জিনিস ভাল বা শৌখিন হয় না। কোন্ কাঠে কি কাজ হবে, কেমনভাবে হবে এসব পূর্বভাবনা সঠিক হওয়া দরকার। কাঠের কাজে যাঁরা দক্ষতা দেখিয়েছেন, নানা সময় তাঁরা এটা মনে রেখেছেন—সঠিক প্রাক্ভাবনার স্পষ্টতা শিল্প নিপুণতার উৎকর্ষ বাড়ায়। কাঠ নিয়ে যাঁরা যে ধরনের কাজ করুন না কেন, আমাদের সমাজ-বিবর্তনের ইতিহাসে প্রত্যেকের কিছু না কিছু অবদান রয়েছে।

নৌ-শিল্প :

যিশুখ্রিষ্টের জন্মেরও বেশ কয়েক বছর আগে থেকে খ্রিষ্টীয় অষ্টম শতক অবধি বাঙালির নৌ-শিল্পের খ্যাতি ছিল সারা পৃথিবীময়। বাংলা সাহিত্যের প্রথম নিদর্শন চর্যাপদেও নৌকার উল্লেখ রয়েছে। কথিত আছে, মনসামঙ্গলের চাঁদসদাগরের সপ্তডিঙার এক একটি ডিঙা (নৌকা) তৈরি করতে ষোলশো কারিগরের এক বছর দিনরাত পরিশ্রম করতে হয়েছিল। বিদেশি পর্যটক মেগাস্থিনিস ও ফা-হিয়েনের বিবরণ থেকে বাংলা নৌ-শিল্পের বিবরণ পাওয়া যায়। পঞ্চদশ শতাব্দীতে ইতালির বিখ্যাত পর্যটক নিকোলা কন্তে বাংলা ভ্রমণের পর বলেন ভিনিসীয় জাহাজ অপেক্ষা

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* রিসার্চ স্কলার, সংগ্রহশালাবিদ্যা বিভাগ, কলিকাতা বিশ্ববিদ্যালয়।

বাংলার জাহাজ আকারে বড়, মজবুত ও তার গঠনশৈলীতেও যথেষ্ট শিল্প নৈপুণ্য আছে। বাংলার এই জাহাজ তেহরা নামে একরকম কাঠ দিয়ে তৈরি হয়।

বাংলার বারো ভুঁইয়ার অন্যতম প্রতাপাদিত্য রায়ের রাজ্য নদীনালা বেষ্টিত হওয়ায়, বাংলার এই অঞ্চলে নৌ-শিল্পের ব্যাপক প্রসারতা ঘটে। রাজা প্রতাপাদিত্যের রাজধানী শ্রীপুরে - নাকি থাকত প্রচণ্ড শক্তিশালী যুদ্ধ জাহাজের এক বহর। বর্তমানেও সুন্দরবনের নদীকেন্দ্রিক বিস্তীর্ণ অঞ্চলের যাতায়াত ব্যবস্থা এবং বহু মানুষের জীবিকা নৌ-নির্ভর।

ডায়মন্ডহারবারের আবদালপুর, কুলপির হরিনারায়ণপুর থেকে প্রাপ্ত মুদ্রায় (পাঞ্চমার্ক মুদ্রা, ঢালাই মুদ্রা) নৌকা চিহ্ন খোদাই করা। এগুলি থেকে নৌ-শিল্পের প্রাচীনত্ব সহজেই অনুমেয়।

সুন্দরবন এলাকার নৌকার বিবরণ থেকে নৌকার কিছু গঠনভিত্তিক নাম পাওয়া যায়। যেমন—ঘুঘু (ছোট ডিঙি), বেতনাই (গোলপাড়া বা কাঠ বোঝাই করার নৌকা), ছিপ, পানসি, বালায়, ভাউলে, কিস্তি, ভড়, বজরা ইত্যাদি।

নৌকা ও ডিঙির মধ্যে কাঠের কাজের নানান কারুকার্য লক্ষ্য করা যায়। বিশেষত উল্লেখযোগ্য, উঁচু কলুইয়ে নানান ধরনের সূক্ষ্ম মৌলিক কাজ যথা—সিংহমুখী, ময়ূরমুখী, বাঘমুখী, টিয়ামুখী, মাছমুখী ইত্যাদি। এই জেলার নৌকা তৈরির কেন্দ্রগুলি তাড়দহের শামুকপোতা, ক্যানিং, ফলতা, নামখানা, কুলতলি, কাকদ্বীপ, ডায়মন্ডহারবার, নূরপুর প্রভৃতি অঞ্চলে বিদ্যমান।

ক্যানিংয়ের গান্ধী কলোনিতে নৌ-শিল্পীদের বসবাস আজও রয়েছে। শিল্পীদের মধ্যে অন্যতম ঁরমানাথ রায়, ঁকুঞ্জবিহারী বিশ্বাস, পাঁচু মজুমদার প্রমুখ। তবে নৌ-শিল্পের গুরু মহাশয় হিসাবে পরিচিত ক্যানিংয়ের দিঘিরপাড় গ্রামের বাসিন্দা ঁশরৎ সরদার।

মন্দির :

মন্দির বা অন্যত্র দেওয়ালের গাত্রে যে সব কাঠের কাজের নকশা দেখা যায় সেখানে কাঠ খোদাইয়ের নিপুণতাই বড় ব্যাপার। খোদাইয়ের মাধ্যমেই শিল্প প্রতিভার নিদর্শন তুলে ধরে শিল্পীরা লোকের মন ছুঁয়ে যাওয়ার চেষ্টা করেন। কাঠের শিল্পীরা প্রকাশ্য স্থানে কাজ করায় সাধারণ মানুষের চাহিদার সঙ্গে নিজেদের শিল্প প্রতিভার পরিব্যাপ্তির মাধ্যমে সৌন্দর্য এবং ছন্দ বজায় রাখতে পারতেন।

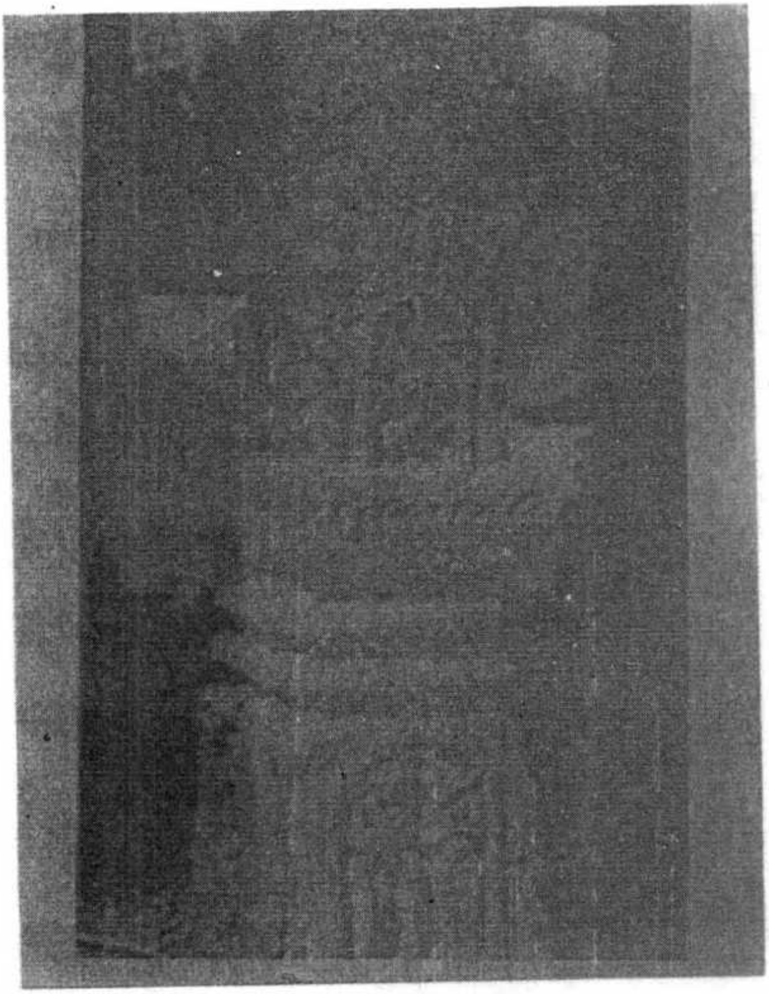
প্যানেল বা দরজার নকশা করতে সময় লাগত। যাঁরা কাজ করাতেন তাদের পছন্দানুযায়ী শিল্পীকে খোদাই করতে হত। কেউ কেউ সব সময় একই ধারার কাজের মাধ্যমে, আবার অনেকে ভিন্ন ভিন্ন ধরনের কাজের মাধ্যমে নিজেদের শিল্প দক্ষতার পরিচয় রেখেছেন। সতর্কদৃষ্টি ও সৃজনশীল চিন্তাভাবনা দিয়ে দক্ষশিল্পী কাঠ খোদাই করে ফুটিয়ে তুলতেন নিজস্ব শিল্পভাবনা। বাটালি, ছেনি আর হাতুড়ি দিয়ে ঠুক ঠুক করে শিল্পী তৈরি করতেন শিল্পবস্তু। বর্তমানে শিল্পীরা যন্ত্রের সাহায্যে কাজ করেন। যন্ত্রের কাজের সঙ্গে পূর্বের কাজের তুলনা না চললেও সৃজনভাবনার অভিনবত্ব ঘটেছে—একথা বলা খুব মুশকিল।

দক্ষিণ ২৪ পরগনা জেলায় কাঠের কাজে সমৃদ্ধ মন্দির বিশেষ উল্লেখযোগ্য। একটি উদাহরণ হল মন্দিরবাজার থানার জগদীশপুরের (বৈরাগীপাড়া) জগন্নাথ, বলরাম ও সুভদ্রার দারুমূর্তি সংবলিত মন্দির। মন্দির অলংকরণে সামাজিক বিভিন্ন চিত্র, ফুল, লতা-পাতা, বিভিন্ন ধরনের মূর্তির দেহরূপের আঙ্গিক দেখতে পাওয়া যায়।

এই অঞ্চলে চণ্ডীমণ্ডপই সামাজিক মিলনক্ষেত্র হিসেবে বিবেচ্য। পৌরাণিক দেবদেবীর নানা কাহিনীর অংশবিশেষ বা বেশ কিছু ধারাবাহিক কাহিনীর অংশ খোদাই দেখতে পাওয়া যায়। যেমন—চণ্ডীমঙ্গল, চণ্ডীর বিভিন্নরূপ, অসুরনিধন দৃশ্য, দশাবতারের চিত্র, জাতক কাহিনী ইত্যাদি।

দারুভাস্কর্যের জন্য দক্ষিণ ২৪ পরগনার যে মন্দিরটি উল্লেখযোগ্য, সে মন্দিরটির স্থায়িত্ব আজ আর নেই। কিন্তু তার অসাধারণ কাঠের কাজ আজও কিছু টিকে আছে। সেগুলি আজ দক্ষিণ ২৪ পরগনার দারু ভাস্কর্যের উৎকর্ষতার

ক্ষেত্রে এক গৌরবোজ্জ্বল নিদর্শন। এই নিদর্শনগুলিই প্রমাণ করে যে, এই জেলা এক সময় কাঠের কাজে বিশেষ উন্নত ছিল। মন্দিরবাজার থানার অন্তর্গত মহেশপুর গ্রামের হালদার বংশের নির্মিত চণ্ডীমণ্ডপ সেই স্মৃতি বহন করে। চণ্ডীমণ্ডপটি স্থাপিত হয় ১৬৩৩ খ্রিস্টাব্দে বা তারও পূর্ববর্তী সময়ে।



চণ্ডীমণ্ডপের স্তম্ভ : মহেশপুর

মন্দিরের অবশিষ্টাংশের মধ্যে উল্লেখযোগ্য হল, মন্দিরগাত্রের অসাধারণ কিছু কাঠের কাজ। বিশাল দালান কোঠার উপর অবস্থিত ছিল কাঠের তৈরি অলংকার সমৃদ্ধ মূল মন্দিরটি। কাঠের কাজ করা ৫০টি খুঁটি আবার কেউ কেউ বলেন ৩২টি বা ২৪টি। অলংকার যুক্ত কাঠের দেওয়াল এবং কাঠের কাজ করা জানালার উপরের অংশ কিছু পাওয়া গিয়েছিল। এখন কেবলমাত্র ১১টি খুঁটি এবং জানালার উপরের অংশ অবশিষ্ট আছে। জনশ্রুতি থেকে জানা যায়, বাসুদেব হালদার নামে এক ব্যক্তি এই মন্দিরের শিল্পী ছিলেন।

সম্ভবত কালের প্রবাহে এটি ভেঙে পড়ায় গৃহস্বামী মণ্ডপের স্তম্ভগুলিকে টালির ছাউনি দিয়ে কৃষ্ণচন্দ্র মন্দিরের বারান্দায় সংস্থাপিত করেছেন (১০টি)। দীর্ঘদিন নোনা আবহাওয়ায় থাকার ফলে এবং উইপোকার ক্রমাগত আক্রমণে স্তম্ভগুলির সৌন্দর্য ও আকৃতি বজায় নেই। উপরের অংশ কেটে বাদ দেওয়ায় উচ্চতা যেমন হ্রাস পেয়েছে তেমনি উইপোকা যুক্ত অংশ চেঁছে ছুলে সমান করায় অলংকরণের বেশ কিছুটা ব্যাঘাত ঘটেছে। বর্তমানে ব্যবহৃত খুঁটিগুলির

উচ্চতা প্রায় সাত ফুট এবং অব্যবহৃত খুঁটির উচ্চতা কিছু বেশি। চারকোনা খুঁটিগুলির উপর থেকে নিচের দিক ক্রমশ মোটা, খুঁটির চারটি পিঠ বা পাশ। প্রতি পিঠে ৮-৯ ইঞ্চি করে চৌকোনা খোপ আছে। বর্তমানে ১১টি খুঁটিতে মোট ৮৮টি খোপ রয়েছে। এই খোপগুলি রামায়ণ, মহাভারত কিংবা পুরাণের কোনো সংক্ষিপ্ত দৃশ্য খোদাই করা যেমন—রাম-লক্ষ্মণ, রাধা-কৃষ্ণ, যশোদা, বলরাম, নারদ, হনুমান, লক্ষ্মী, নারায়ণ, সরস্বতী, পুতনা, অলস ভঙ্গিমায় নারী প্রভৃতি প্রচুর মনুষ্যমূর্তি বিভিন্ন ভঙ্গিমায় বিভিন্ন দৃশ্যে আছে। এছাড়া খুঁটিগুলির সর্বাঙ্গে বিভিন্নভাবে সজ্জিত আছে বৃক্ষ, শাখা, লতা, ফুল, ফুলে বসে মধু পানরত পাখি, ঘণ্টা, হাঁস, সিংহমূর্তি প্রভৃতি।

স্তম্ভগুলিতে খোদাই কাজের এক বৈশিষ্ট্যপূর্ণ নিদর্শন হল, এগুলির গায়ে উৎকীর্ণ শিকলের সারি যা দূর থেকে মনে হয় যেন লোহার শিকল। প্রকৃতপক্ষে মানুষের মূর্তিকে পরস্পর সংলগ্ন অবস্থায় এমনভাবে রাখার জন্য এমনটি ভুল সবার ক্ষেত্রে হয়। বিশেষ করে একটি স্তম্ভের দুটি শিকল এমনই দর্শনীয় যে, একটি ঘণ্টার উপর হাঁটু মুড়ে মাথা নত উপবিষ্ট এক ব্যক্তির কাঁধের উপর আর এক উপবিষ্ট ব্যক্তি, তার উপরে উপরেও ঐভাবে অবস্থিত উল্লম্বভাবে যেন এক মিছিলের সারি যা রথের কোণের ভাস্কর্য 'বর্শার' (সংহার শৃঙ্খল যা মৃত্যুলতা ভাস্কর্য মোটিফ) সঙ্গেই তুলনীয় হতে পারে।

চণ্ডীমণ্ডপের স্তম্ভ : মহেশপুর

সময়ের সঙ্গে সংরক্ষণের অভাবে এই অনন্য সৃষ্টি দক্ষিণ ২৪ পরগনা জেলার নোনা আবহাওয়া, ঘুণপোকা এবং উইপোকার আক্রমণে বিনষ্ট হয়ে স্থাপত্যটি বিস্মৃতির অতলে তলিয়ে যাচ্ছে।

দেবদেবী :

দক্ষিণ ২৪ পরগনা জেলার বিভিন্ন প্রান্তে ছড়িয়ে ছিটিয়ে আছে কাঠের তৈরি বিভিন্ন দেবদেবী। প্রতিটি দেবদেবীর নিখুঁত গঠন শৈলী ও কারুকার্য থেকে শিল্পীর শিল্প সমৃদ্ধ সজাগ দৃষ্টিভঙ্গির পরিচয় পাওয়া যায়। এই দেবদেবীর মূর্তিগুলি আজও জেলার বিভিন্ন স্থানে মহাধুমধামের সঙ্গে পূজিত হয়।

জয়চণ্ডীদেবীর নামানুসারে আদি গঙ্গার তীরে জয়নগরের চণ্ডীতলার পরিচিত সেই মধ্যযুগ থেকে জয়চণ্ডীদেবীর মন্দিরে জয়চণ্ডী মূর্তিটি প্রায় চার ফুট উঁচু কাঠের, সম্ভবত বকুল কাঠের (জনশ্রুতি)। জয়চণ্ডী মূর্তিটি দ্বিভুজা, ত্রিনয়না, গৌরবর্ণা এবং দেবীর উভয় হস্তে অভয় ও বরাভয় মুদ্রা।

মথুরাপুর থানার শ্রীকৃষ্ণনগর-গোয়ালবেড়িয়া গ্রামে বৈদ্যদের ধ্বংসপ্রাপ্ত আটচালায় ব্যবহৃত কাঠের স্তম্ভের অলংকরণ কাঠের কাজের ক্ষেত্রে এক বিশেষ স্থান দখল করে আছে।

কৃষ্ণচন্দ্রপুর মোড় থেকে হাঁটা পথে ছত্রভোগ ও এখানকার ত্রিপুরাসুন্দরী-চিত্রটি দারুনির্মিত বর্ণ রক্তাভ হরিদ্রা, চতুর্ভুজ, দক্ষিণ উর্ধ্ব হস্তে কর্কট মুদ্রা, পরিধানে রক্তাভ বস্ত্র।

এই জেলার জয়নগর থানার অন্তর্গত বহড়ু গ্রামের বসু পরিবারের গৃহদেবতা শ্যামসুন্দরের মন্দির প্রাঙ্গণে ক্ষুদ্রাকার একটি ভগ্ন কাঠের মূর্তি লক্ষ্য করা যায়, যার পাদদেশে একটি লিপি বর্তমান। লিপিটি হল "সেবাদাস গুরুকৃষ্ণ বৈষ্ণবচরণ অভিলায/শ্রী ক্ষেমানন্দ মণ্ডল দাস মিস্ত্রী শ্রীরামকুমার দাস কারিকর/সাংডাক জয়নগর/খোদাপাড়া বায।" মূর্তির পিছনের অস্পষ্ট লিপিটি পাঠোদ্ধারে জানা যায়, ১২৯১ বঙ্গাব্দে এটি নির্মিত হয়েছিল। মূর্তিটির কারিগর রামকুমার দাসের বাড়ি ছিল জয়নগরে এবং তার উত্তরাধিকারীরা আজও ঐ গ্রামে বৃষকাঠ, দেবদেবীর মাটির প্রতিমা, পুতুল প্রভৃতি তৈরির মধ্য দিয়ে পূর্বপুরুষের শিল্পধারাটিকে বহন করে চলেছেন।

বিষ্ণুপুর থানার অন্তর্গত বাখরাহাটে অবস্থিত রাধাবল্লভজীউর মন্দিরের (১২১৯ বঙ্গাব্দ) কষ্টি পাথরেব কৃষ্ণ ও পিতলের গোপাল বিগ্রহ কাঠের মঞ্চের উপর প্রতিষ্ঠিত রয়েছে।

মন্দিরবাজার থানার টেটিবেড়িয়া গ্রামের ব্রাহ্মণ পাড়ায় বন্দ্যোপাধ্যায় পরিবারে কাঠের বংশীধারী কৃষ্ণের পদ্মাসনে উৎকীর্ণ পুরানো বাংলা অক্ষরে প্রতিষ্ঠাতার নাম — "সেবাৎ বামশাগর বন্দপাধ্যায়"। বংশতালিকা, বিগ্রহশৈলী ও এই ধরনের হরফের ব্যবহার মূর্তিটির প্রাচীনত্বের ইঙ্গিত বহন করে।

বোড়ালের জঙ্গলাকীর্ণ সেন দীঘির পাড়ে উঁচু ঢিবির মাটির স্তূপ খুঁড়ে দেবী ত্রিপুরাসুন্দরীর দারুমূর্তি আবিষ্কৃত হয়। ত্রিপুরাসুন্দরী দশমহাবিদ্যার অন্তর্গত ষোড়শী মূর্তি। সাত আট শত বছরের পুরাতন দেবীমূর্তি দীর্ঘকাল মাটিব নিচে থাকায় এর অধিকাংশ অঙ্গপ্রত্যঙ্গ নষ্ট হয়ে গেছে।

এই জেলার বাসন্তী থানার ভরতগড়ের একটি বিশিষ্ট গ্রাম হিরন্ময়পুরের প্রবীণ ব্যক্তি সতীশচন্দ্র মণ্ডল তাঁর পুকুর খননের সময় একটি নকশা করা কাঠ পেয়েছেন, যাতে বিভিন্ন মূর্তি খোদাই করা আছে। সেটি নিকটবর্তী বাঁশীবাবুর বাজারের মালিকের তত্ত্বাবধানে রয়েছে।

এছাড়া দক্ষিণ ২৪ পরগনার বিশেষ উল্লেখযোগ্য, কাঠের দেবদেবীর মূর্তিগুলি হল—ডায়মন্ডহারবার থানার অন্তর্গত সরিষার কাঠের কালী, পঞ্চানন্দ ও মদনমোহন, মন্দিরবাজার থানার বিদ্যাধরপুরের গোপীবল্লভ, বারুইপুর থানার আটিসারার গৌরনিতাই, বারুইপুরের বিশালাক্ষী, সোনারপুর থানার গড়িয়ার মহামায়া মন্দিরের দুর্গা, কালিকাপুরের ভাঁটার বিশালাক্ষী, কুলপি থানার করঞ্জলির শীতলা, বিষ্ণুপুর থানার শিবানীপুরের শিবানী, মগরাহাট থানার রঙ্গিলাবাদের বিশালাক্ষী ইত্যাদি।

রথ :

দক্ষিণ ২৪ পরগনার কাঠের শিল্পীরা মন্দির-দেবদেবী নির্মাণের মতো আবহমানকাল ধরে অসামান্য কারিগরি দক্ষতার পরিচয় দিয়েছেন রথ তৈরির ক্ষেত্রে। রথ তৈরিতে একদিকে যেমন শিল্পীকে তার কারিগরি শিল্পকৌশল প্রয়োগ করতে হত, অন্যদিকে রথ সজ্জায় দুটি ধাবমান অশ্ব, সারথি, গরুড়, পরী, বাদিকা, চামরধারিণী প্রভৃতির মূর্তি নির্মাণে এবং রথের প্যানেলে ব্যঙ্গাত্মক সামাজিক ও কিছু উন্নত সূক্ষ্ম কাজ প্রদর্শন করতে হত। এছাড়া ছোট বড় নানা ধরনের সামাজিক চরিত্রের পুতুল যেমন মেম, সাহেব, খ্রিস্টান মহিলা, বরকন্দাজ, গৃহকর্মে নিযুক্ত মহিলা, বিভিন্ন ধরনের সাধু এবং রথের গায়ে রঙিন চিত্রাঙ্কনে যথেষ্ট নৈপুণ্য সাধন করতে হত। 'সংহার শৃঙ্খল' খোদাই যুক্ত রথের থাম অথবা থামের উপর সাজানো বিভিন্ন জন্তু জানোয়ার ও সওয়ারী মূর্তি দেখতে পাওয়া যায়। চিত্রে মূলত জন্তু জানোয়ার ও তাদের সওয়ারীরা পরস্পর যুদ্ধে ব্যস্ত।

এই জেলার গ্রাম-গ্রামান্তরের প্রাচীন রথের স্থাপত্য ও ভাস্কর্যের দিকে দৃষ্টি নিবদ্ধ করলে শিল্পীর তীব্র নিষ্ঠা, একাগ্রতা ও উন্নত সৃজনপ্রতিভা সম্বন্ধে সম্যক ধারণা লাভ করা যায়।

সূত্রধর সমাজ ছাড়া দক্ষিণ ২৪ পরগনায় অনেক জাতির মানুষই দক্ষতার সঙ্গে রথ তৈরি করেন। কর্মকার গোষ্ঠীর মানুষজনও রথ তৈরিতে বিশেষ খ্যাতি অর্জন করেছিলেন। এই গোষ্ঠীর এক শিল্পী হলেন বাজারবেড়িয়া গ্রামের কিশোরী কর্মকার। চৈতন্যপুর, ভবানীপুর ও জয়নগর—মজিলপুরের তেলিপাড়ার কাঠের রথগুলি কিশোরী ও তাঁর সহকর্মীদের তৈরি। তাঁর বংশধরেরা আজও মাটির প্রতিমা, পুতুল তৈরি ও পুরানো রথ সারাইয়ের মাধ্যমে পারিবারিক শিল্পকে বাঁচিয়ে রেখেছেন।

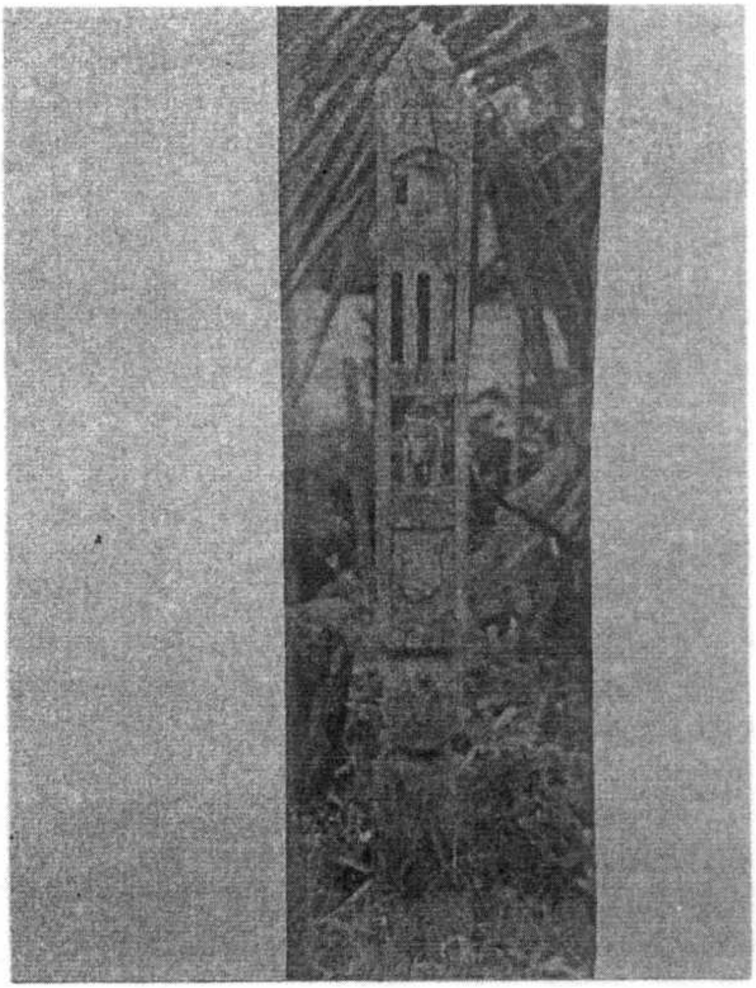
এই জেলার বিভিন্ন উল্লেখযোগ্য রথের মধ্যে—বেহালার—শখেরবাজার, ঠাকুরপুকুরের রথ, সোনারপুরের—বনহুগলি, রাজপুরের রথ, বারুইপুরের—জগন্নাথের রথ, বিষ্ণুপুরের—কাঞ্চনবেড়িয়ার জগন্নাথের রথ, দক্ষিণ বিষ্ণুপুরের বাল্য রঘুনাথের রথ, ফলতার—বেলসিংয়ের জগন্নাথের রথ, ফতেপুরের জগন্নাথের রথ, বজবজের—বজবজের রথ, বাওয়ালির মণ্ডল পরিবারের রথ, পূজালির রথ, মহেশতলার-ময়নগরের, পারবাংলার, মহেশতলার, নুঙ্গির, বনেশ জোড়হাটের রথ, জয়নগরের—মিত্রপরিবারের জগন্নাথের রথ, বহড়ুর জগন্নাথের রথ, মন্দিরবাজারের—জগদীশপুরের জগন্নাথের রথ, মগরাহাটের—ইজারপুরের জগন্নাথের রথ, কুলপির-দেরিয়া, শ্যামবসুর চকের রথ।

এই জেলার চাউলখোলা, জয়নগর—মজিলপুর সূত্রধর সম্প্রদায়ের কেন্দ্রগত বসতি হিসাবে পরিচিত।

বৃষকাঠ :

বৃষকাঠ শিল্পের জন্ম কবে সঠিকভাবে না জানা গেলেও, এই শিল্প যে কয়েকশো বছরের পুরানো সে বিষয়ে কোনো সন্দেহ নেই। নীরস কাঠকে শৈল্পিক নৈপুণ্যের দ্বারা নানা রূপ দিয়ে ছুতোরেরা কাঠের কাজকে স্থান দিয়েছে দেবালয়ে, বদ্ধঘরে, প্রদর্শনীতে। কিন্তু বৃষকাঠ নির্মাণের মাধ্যমে তাদের শিল্পের স্থান হয় মন্দিরের উঠোনে - চাতাল বা চৌমাথায় অথবা তেমাথায় প্রধানত পুকুর, দিঘি, খাল, নদী অথবা সমুদ্রের ধারে। যদিও শিল্পীর এই সৃষ্টির স্থায়িত্ব কম দিন তবুও বেল, নিম, যজ্ঞডুমুর কাঠ হিসাবে ব্যবহৃত হওয়ায় প্রকৃতির সঙ্গে থেকে বিবর্ণ হতে সময় নেয় অন্তত বছর পাঁচেক। বৃষ কাঠ স্মৃতিতর্পণের মাধ্যমে আত্মার স্বর্গ প্রাপ্তির জন্য তৈরি প্রকৃতিতে দণ্ডায়মান এক উল্লেখযোগ্য কাষ্ঠশিল্প বিশেষ। শ্রাদ্ধের রকমফেরে বৃষোৎসর্গ সর্বোৎকৃষ্ট। এর সঙ্গে জড়িয়ে আছে সমাজ-ধর্ম-মানুষ-ষাঁড়-গাভী-বাছুর এবং সর্বোপরি লোকাচারের চালচিত্র।

বৃষোৎসর্গ শ্রাদ্ধের আচার-আচরণ সম্বন্ধে আলোচনা না করে এখানে মূলত বৃষকাঠের গঠনশৈলী নিয়ে আলোচনা করব। দক্ষিণ ২৪ পরগনার বৃষ কাঠে সেভাবে রঙের ব্যবহার দেখা যায় না। কাঠ হিসাবে প্রধানত ব্যবহার হয় নিম, বেল, যজ্ঞডুমুর। বৃষ কাঠের দৈর্ঘ্য হয় মোটামুটি ছয় থেকে সাত ফুট। বৃষ কাঠকে কতকগুলি চৌখুপীতে ভাগ করে নেওয়া হয়। তারপর খোদাই কাজ শুরু হয়। সমগ্র বৃষ কাঠটিতে কতকগুলি অংশ দেখতে পাওয়া যায়।



বৃষকাঠ : কুমীরমারি

নিচের অলংকরণহীন ভূমি সাধারণত দেড়ফুট মতো হয়, এই অংশটি মাটির নিচে থাকে। তার উপরের বারো থেকে চোদ্দ ইঞ্চি অংশে মানব আকৃতি তৈরি করা হয়। মানব আকৃতির উপর শঙ্খ, চক্র, গদা, পদ্ম দিয়ে যথাক্রমে ছয় ইঞ্চি চারপাশ খোদিত থাকে। তার উপরের ছয় ইঞ্চি চৌকো ঘর কুঁদে ভিন্ন একটি বৃষ তৈরি করে ওখানে স্থাপন করা হয় পেরেক দিয়ে। মূর্তির মুখের দিকে ষাঁড়ের গতি নির্দেশিত থাকে। ষাঁড়ের উপরে ছয় ইঞ্চি চৌকো অংশ কুঁদে বারো দরজা তৈরি করা হয়। তার উপরের দশ ইঞ্চি চৌকো অংশ খোদিত করে শিবলিঙ্গ প্রতিষ্ঠা করা হয়। শিবলিঙ্গের উপরে রথের চূড়ার উচ্চতা প্রায় ছয় ইঞ্চি। চূড়ার উপর থাকে ত্রিশূল। চৌখুপীগুলির মাঝে থাকে ছোট খাঁজকাটা সলিড বিট। এই বিটগুলিতে কৃষ্ণ-কৃষ্ণ, রাম-রাম, হরে-কৃষ্ণ, হরে-রাম লেখা থাকে। খোদিত অংশ থেকে শিল্পীর স্বকীয় নিপুণতার পরিচয় পাওয়া যায়।

পুরুষমূর্তি গলায় পৈতা, কোথাও জোড়হাত ধুতি পরিহিত আবার বর্তমানে স্যুট পরিহিতও দেখা যায়। নারীমূর্তি সাধারণত শাড়ি পরিহিত মাথায় ঘোমটা দেওয়া থাকে। স্বামী থাকতে বউ মারা গেলে ষাঁড়ের জায়গায় গাইবাছুর থাকে। উত্তর-পূর্ব দিকে মুখ করে বৃষ কাঠকে প্রতিষ্ঠিত করা হয়।

গোসাবা থানার ছোটমোল্লাখালী গ্রামের এক বিশিষ্ট বৃষকাঠ শিল্পী হলেন মধু রপ্তান। বর্তমানে তাঁর বয়স বিরাশি বছর। সাক্ষাৎকারে জানতে পারি, তিনি আট-নয় বছর বয়স থেকে দাদুর কাঠের কাজের সঙ্গী হন। পরবর্তীকালে বিভিন্ন কাঠের কাজের সঙ্গে বৃষকাঠ তৈরিতে দক্ষতা অর্জন করেন। শিল্পীর বক্তব্য অনুযায়ী ধর্মীয় সামাজিক কাজ হিসাবে প্রথম প্রথম তিনি কাঠ যোগান দিলে বিনা পারিশ্রমিকে বৃষকাঠ তৈরি করে দিতেন। পরবর্তীকালে একটি কাপড়, একটি কাঁসার গ্লাস ও পঞ্চাশ টাকা নিতেন এবং বর্তমানে মজুরি হিসাবে তিনি ৫০১ টাকা নেন।

শিল্পী এ কাজের জন্য যন্ত্র হিসাবে ছোট বড় নিন, হাতুড়ি, রেঁদা, কুড়ুল ব্যবহার করেন। এছাড়া দক্ষিণ ২৪ পরগনার অন্যান্য নাম করা বৃষকাঠ শিল্পীরা হলেন——বলরামপুরের শৈলেন কর্মকার, রামলাল চকের শিল্পী গঙ্গা (পদবি অজানা), ক্যানিং-এর পালান ও হারান কর্মকার, রায়পুরের শিল্পী নিরাপদ কর্মকার।

পুতুল :

লোকশিল্পের আঙ্গিকে পুতুল ও পুতুলনাচ বিশেষ জনপ্রিয় এবং ঐতিহ্যেও বেশ প্রাচীন। পুতুলনাচের পুতুল সাধারণত তিন ধরনের হয়—ডাঙের পুতুল, সুতোয়টানা পুতুল এবং দস্তানা পুতুল। এর মধ্যে ডাঙের পুতুল এবং দস্তানা পুতুল তৈরিতে কাঠ ব্যবহৃত হয়। এই জেলার প্রধানত ডাঙের পুতুল উল্লেখযোগ্য। এই পুতুলের সাহায্যে ঐতিহাসিক সামাজিক অথবা পৌরাণিক পালাগুলি অভিনীত হয়।

ডাঙের পুতুল হাল্কা-সস্তা কাঠে প্রধানত তৈরি হয়। পুতুলগুলির দেহাংশ গঠনে শৈল্পিক স্থূলতা থাকলেও টানা টানা চোখ, টিকালো নাক যুক্ত সুন্দর মুখ গঠনের মাধ্যমে শিল্প প্রতিভার দক্ষতা প্রকাশ পায়। এদের পোশাক যাত্রাদলেরই মতো। মুল পুতুলগুলির প্রত্যেকটিই দুই থেকে আড়াই ফুট লম্বা, পুতুলের মুণ্ড এবং হাত দুটি তার দেহের সঙ্গে শিথিলভাবে লাগানো থাকে, মুণ্ডটি কাঠের একটি গজালের সঙ্গে এমনভাবে আঁটা থাকে যাতে সেটি গর্দানের ভেতরের একটি গর্তের মধ্য দিয়ে ঢুকে পিঠের ফাঁকা অংশে বেরিয়ে আসতে পারে। হাত দুটি কাঁধের কাছে জোড়া অংশে বাঁধা দু'টুকরো দড়ি নিচের দিকে ঝুলে থাকে যাতে টান দিলে হাত দুটি ইচ্ছামতো ওঠা-নামা করা যায়। আর কাঠের গজাল ডাইনে বাঁয়ে ঘুরিয়ে মুণ্ডটি নাড়ানো হয়।

এই শ্রেণীর পুতুল নাচের জন্মস্থান এই জেলার প্রধানত জয়নগর-মজিলপুর, ডায়মন্ডহারবার, ফলতা, বিষ্ণুপুর।

ডাঙের পুতুলের প্রকৃত ঐতিহ্য কিন্তু দক্ষিণ ২৪ পরগনা কেন্দ্রিক। এই পুতুলগুলি প্রধানত হলুদ, গামার, শিমুল, আমড়া, ছাতিম প্রভৃতি হাল্কা কাঠ দিয়ে সূত্রধরেরা তৈরি করেন।

বর্তমানে রাজ্য সরকারের লোকসংস্কৃতি দপ্তরের উদ্যোগে পুতুল নাচ কিছুটা উজ্জীবিত হয়েছে। সেজন্য এই জেলার চৈতন্যপুর, মায়াহাউড়ি, দত্তিপুর ইত্যাদি অঞ্চলের শিক্ষিত যুবকরা ডাঙ পুতুল নাচ নিয়ে নতুন উদ্যমে এগিয়ে এসেছেন।

জেলার সাধুর হাট, খাগড়াকোলার ডাঙ পুতুল নাচ বিশেষ পরিচিত। কৈলাশ হালদার, হরিপদ হালদার এবং বাগম্বর হালদারের চেষ্টায় প্রায় একশো পঞ্চাশ বছর আগে খাগড়াকোলায় পুতুল নাচ প্রচলিত হয়। কৈলাশ এবং হরিপদ হালদার নিজেরাই কাঠের পুতুল তৈরি করতেন।

জয়নগর থানার কুলতলি অঞ্চলে ক্ষীরোদচন্দ্র মণ্ডল এবং দেবেন্দ্রনাথ নস্কর শোলার তৈরি দেহ ও কাঠের তৈরি মাথা দিয়ে তারের পুতুল তৈরি করেন। এছাড়া উল্লেখযোগ্য পুতুল তৈরির শিল্পী হলেন বাজারবেড়িয়ার প্রফুল্ল কর্মকার, চৈতন্যপুরের সতীশ হালদার প্রমুখ।

এই জেলার খ্যাতনামা পুতুল নাচ পার্টি হল, জ্ঞানদা অপেরা—খাগড়াকোলা (ডায়মন্ডহারবার), ১নং টকি চৈতন্যপুর, শ্রীশ্রী কালীমাতা-বাজারবেড়িয়া (মন্দিরবাজার), যদুনাথ অপেরা—খাগড়াকোলা।

সিন্দুক :

কাঠ শিল্পীরা গুপ্তধন এবং অন্যান্য অত্যন্ত প্রয়োজনীয় জিনিস যত্নসহকারে রাখার জন্য কাঠের মজবুত সিন্দুক

তৈরি করতেন। এমনই একটি সিন্দুক ছিল আমাদের বাড়ির দক্ষিণ বারান্দার একধারে দণ্ডায়মান। সিন্দুকের গায়ে শিল্পীর নিপুণ হাতের কারুকার্য থেকে তাঁর শিল্পপ্রতিভার পরিচয় পাওয়া যায়। ক্ষুদ্র ক্ষুদ্র কাঠের উপর বাটালি ও হাতুড়ি দিয়ে তৈরি শিল্পকলা থেকে শিল্পীর মনের একাগ্রতা ও মস্তিস্কের উন্নত চিন্তা ভাবনার পরিচয় পাওয়া যায়।

সিন্দুকটি ছিল চারকোনা, ছপায়া যুক্ত চার ফুট চওড়া, ছয় ফুট লম্বা এবং পাঁচ ফুট উচ্চতা সম্পন্ন। ছটি দেড় ফুট লম্বা পায়ার উপরে সিন্দুকের মূল অংশটি স্থাপিত ছিল। চারকোনার পায়ার উপরের অংশ ছিল পদ্মকুঁড়ির মতো ডিজাইন করা। নিচে, উপরে ও চারপাশ ছিল মজবুত তক্তা দিয়ে ঘেরা। উপরের তক্তার পাটাতন দু'ফুট বাই আড়াই ফুট কেটে তৈরি, আর প্রবেশ পথে একটি তালাচাবি যুক্ত মজবুত তক্তা ঢাকনা লাগানো থাকত। চারপাশের কাঠে এবং মাঝের কাঠের উপর দিয়ে নানান কাঠের কাজ এবং অজস্র পেরেক মারা। ফলে পাশ থেকে ধারালো কিছু দিয়ে আঘাত করে সহজে নষ্ট করা ছিল অসম্ভবপর। সৌন্দর্য ও প্রতিরক্ষার এক সুষম বিন্যাস ছিল চতুষ্পার্শ্বে। প্রতিটি দিকের উপর, নিচে ও পাশের অংশ ছিল ফুল, লতাপাতা দ্বারা সজ্জিত, তার মাঝে ছিল কাচ বসানোর খোপখোপ। আর ছিল গাছ, পাখি, গরু, হরিণ, ময়ূর, মাছ জলাশয় দ্বারা সুসজ্জিত, সুষমামণ্ডিত স্ফীতোন্নত কাঠের কাজ।

সুন্দরবনের নোনা আবহাওয়া, ঘুণপোকা, উইপোকার আক্রমণে এবং সর্বোপরি অবহেলা অযত্নে সেই অসাধারণ খোদিত কাঠের কাজের সিন্দুক দিনে দিনে ধ্বংস হয়ে গেছে।

অন্যান্য কাঠের কাজ :

কাঠের বিভিন্ন শিল্পকলার সঙ্গে কাঠ-খোদাই-চিত্র পদ্ধতিরও পরিবর্তন ঘটেছে। যদিও এই পদ্ধতি বহুদিনের তবুও মাত্র গত কয়েক বৎসরের মধ্যে চিত্রশিল্পের এই বিশেষ বিভাগটি চরম উৎকর্ষ লাভ করেছে।

জেলার অন্যান্য কাঠের কাজও শিল্পকলা হিসাবে ঐতিহ্যবাহী।

কাঠের সিংহাসন, পালকি, ডুলি-চতুর্দোলায় নানান নকশা ও অলংকার আঁকা থাকত। এছাড়া খোদাই মূর্তি, জোড়া টিয়া, শুকশারি, ব্যাঙ্গমা-ব্যাঙ্গমী, পা তোলা জোড়া সিংহ, পদ্ম ও কদম ফুলের নকশা আঁকা থাকত।

জলচৌকি ও পিঁড়ির ক্ষেত্রে মাঝখানে বড় ফুল ও চারপাশে লতাপাতার নকশা আঁকা থাকত। বারুইপুরের আটঘরায় প্রাপ্ত চন্দনপিঁড়ি বিশেষ উল্লেখযোগ্য।

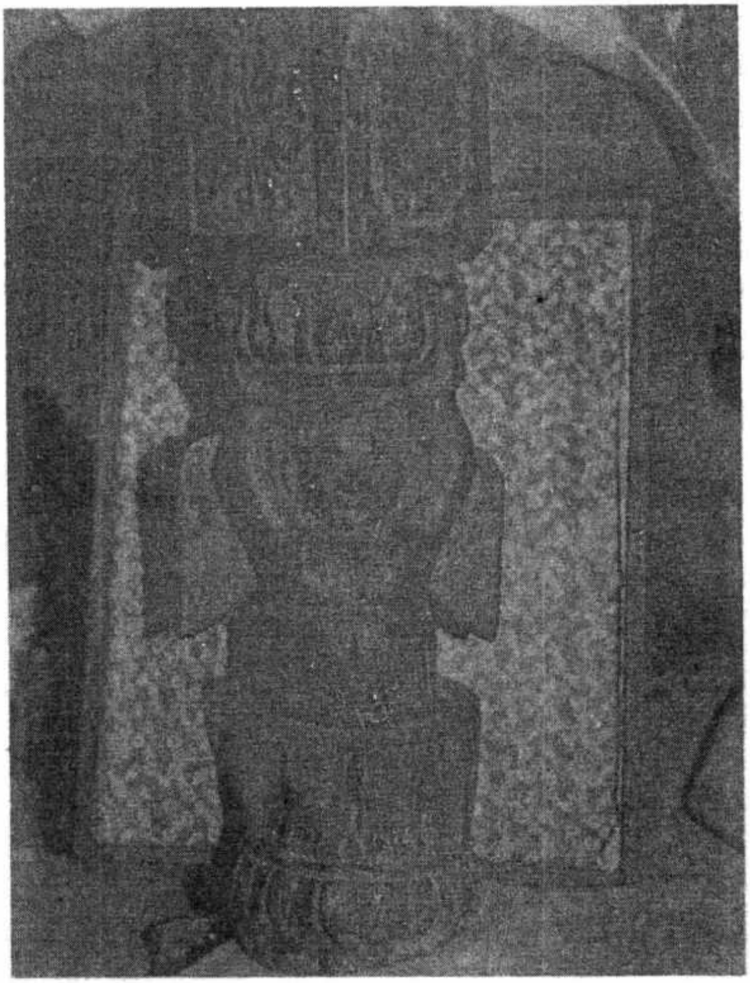
খাট ও পালঙ্কে নকশা করা হত ভেষজ জৈব অলংকরণ। চারটি পায়ায় হাতি, সিংহ বা বাঘের থাবা থাকত এবং মাথা হত ফুলের কুঁড়ির মতো। প্যানেলের কেন্দ্রে ময়ূর, ডানা ছড়ানো ঈগল, শুকশারি, ড্রাগন, সিংহমুখ, পরীমুখ ও চার দিক স্ফীতোন্নত ফুল, লতা-পাতা ইত্যাদি থাকত।

হ্যামিলটন সাহেবের আমন্ত্রণে রবীন্দ্রনাথ গোসাবায় আসেন ১৯৩২ সালের ২৯ শে ডিসেম্বর এবং ফিরে যান ১৯৩৩ সালের ১লা জানুয়ারি। রবীন্দ্রনাথের সেই স্মৃতি বিজড়িত গোসাবার কাঠের "বেকন বাংলোর" ঐতিহাসিক গুরুত্ব অপরিসীম। সেই হিসাবে বাংলোটির দ্রুত সংস্কার-সাধন ও সংরক্ষণ প্রয়োজন।

এছাড়া বিভিন্ন সংগ্রহশালায় সংগৃহীত ও জেলার বিভিন্ন স্থানে ছড়িয়ে ছিটিয়ে থাকা কাঠের কাজের মধ্যে উল্লেখযোগ্য হল—চাকাওয়ালা হাতি, ঘোড়া, পেঁচা, লক্ষ্মীর ঝাঁপি, ঢেঁকি, কাঠের বারকোশ, কৌটো, বইয়ের মলাট, বেগমদের খেলার নকশাকাটা তাস, ছেলে ভুলানো খেলনা, নানান কাঠের পাত্র, বিভিন্ন নাচের মুখোশ, সাঁওতালি, ঢুলি, বীনা, কাপড় ছাপার নকশা ইত্যাদি।

কাঠের দুর্মূল্য এবং বিকল্প উপাদানে তৈরি জিনিসের জন্য আগামী দিনে আমরা হয়তো হদিস পাব না হাতুড়ি, বাটালি দিয়ে কাঠ খোদাই করে কি ধরনের জিনিস তৈরি হয়েছিল। বাড়ি থেকে মন্দিরে, নদীতে, চিত্ত বিনোদনের ক্ষেত্রে অভিজ্ঞ কাঠ খোদাই শিল্পীরা চিত্রে, কথায় এবং খোদাই কাজে গভীর মনোযোগ ও দক্ষতার পরিচয় দিয়েছেন। চারু এবং কারুশিল্প অঙ্গাঙ্গিভাবে মিশে গিয়েছিল এই দারুশিল্প বা ভাস্কর্যের জন্যই। অতীতের নিপুণ হাতের সূক্ষ্ম কাজের দক্ষ দারু ভাস্কর বর্তমান সময়ে সত্যিই বিরল।

শিল্পের অনুকূল পরিবেশের সঙ্গে চাহিদা আর বাজার থাকাও জরুরি। শিল্পীরা দিনের পর দিন কাজ করবেন অথচ সঠিক পারিশ্রমিক পাবেন না, এমন হলে শিল্পে আসবে জড়তা, সর্বোপরি দেখা দেবে অস্তিত্বের সংকট। কাঠের কাজের মাধ্যমে শিল্পীরা একসময় সমাজচিত্র তুলে ধরলেও সমাজ বদলের সঙ্গে সঙ্গে শিল্পের প্রসারতা হ্রাস পেয়েছে। সত্যি কথা বলতে কি কাঠ খোদাই কাজে দক্ষশিল্পীরা এখন জীবনের প্রয়োজনে জীবিকা ছাড়তে বাধ্য হচ্ছেন।



বহড়ুর বসু পরিবারের প্রাচীন পালঙ্কে কাঠের কাজ

তথ্যসূত্র :

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